BELFORT INSTRUMENT Co.

800-937-2353 www.DIGIWX.com

DigiWx®
Automated Weather Observing System AWOS

Installation and Checkout Manual

Proprietary

Prepared in Response to

FAA, Automated Weather Observing System (AWOS) Requirements

June 2006

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Appendix A: FAA Construction Notification Requirements & Forms

1.0 INTRODUCTION

1.1 PURPOSE – This manual has been prepared to thoroughly describe the planning, FAA coordination requirements, hardware/software installation and checkout procedures to be followed by system owners and qualified technicians to assure successful installation and facility commissioning of a DigiWx™ AWOS system.

1.2 SCOPE – This manual has been developed in accordance with the guidance and requirements described in FAA Advisory Circular, AC No: 150/5220-16C and other referenced documents. This manual is intended to support installation and operational checkout procedures applicable to all FAA approved DigiWx™ AWOS configurations. Consequently, only those hardware and software installation procedures applicable to the specific DigiWx™ AWOS configuration of options purchased need be completed. Owners and installation technicians are encouraged to contact the Belfort product support group at 1-800-937-2353 regarding questions concerning the applicability of any specific installation procedure.

2.0 APPLICABLE DOCUMENTS & LIST OF ACRONYMS

2.1 APPLICABLE DOCUMENTS:

FAA AC No: 150/5220-16C	Automated Weather Observing Systems (AWOS) For Non-Federal Applications
FAA Order 6700.20A	Non-Federal Navigational Aids and Air Traffic Control Facilities
FAA Order 6560.13B	Maintenance of Aviation Meteorological Systems and Miscellaneous Aids
FAA Form 6030-1	Facility Maintenance Log
FAA Order 6560.20B	Siting Criteria for Automated Weather Observing System (AWOS)
FAA Form 7460-1	Notice of Proposed Construction or Alteration
FAA Form 7460-2	Notice of Actual Construction or Alteration

2.2 LIST OF ACRONYMS

AC	Alternating Current
AVG	Average
ALS	Ambient Light Sensor
AWOS	Automated Weather Observing System
BIT	Built-In-Test
CTAF	Common Traffic Advisory Frequency
DATU	Data Acquisition Terminal Unit
DC	Direct Current
DCP	Data Collection Processor
DDR	Digital Data Receiver

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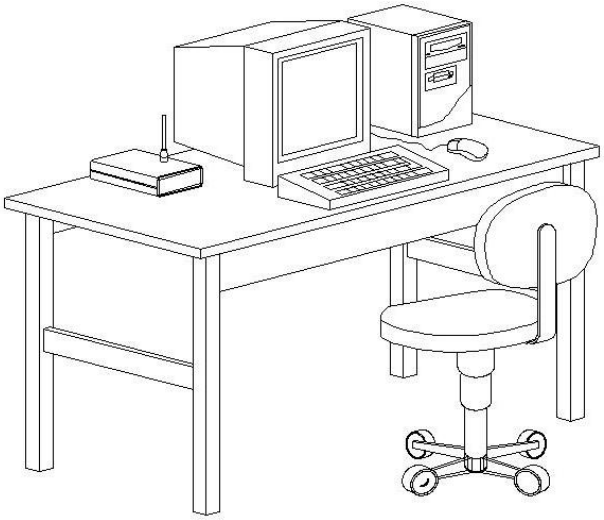
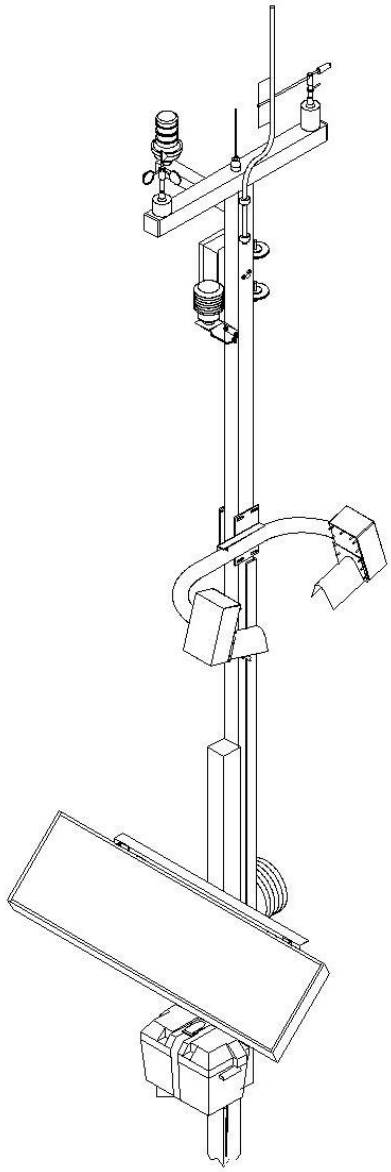
DMM	Digital Multi-meter
DSL	Digital Subscriber Line
DTMF	Dual-Tone Multi-Frequency
ELDF	Endless Loop Dedicated Frequency
EEPROM	Electrically Erasable Programmable Read-Only Memory
FAA	Federal Aviation Administration
FBO	Facility Base Operator
FCC	Federal Communication Commission
FRDF	Facility Reference Data File
FRU	Field Replaceable Unit
FSDO	Flight Standards District Office
Hg	Mercury
HHDU	Hand Held Display Unit
ICAO	International Civil Aviation Organization
ID	Identification
INOP	Inoperative
KT	Knots
LED	Light Emitting Diode
LRU	Lowest Replaceable Unit
MCIF	Microphone Click Interface
MHz	MegaHertz (million Hertz)
MOU	Memorandum of Understanding
MSL	Mean Sea Level
NAVAID	Navigational Aid
NIST	National Institute of Standards and Technology
NOTAM	Notice To Airmen
OMM	Operations and Maintenance Manual
RAF	Regional Airway Facilities
REL HUM	Relative Humidity
RIF	Radio Interface
RPM	Revolutions Per Minute
T1	T-carrier 1 (digital transmission line, 1.544 Mbps, 24 voice channels)
UHF	Ultra High Frequency
UNICOM	Universal Integrated Communications (System)
VAC	Volts Alternating Current
VDC	Volts Direct Current
VDD	Version Description Document (DigiWx® Configuration Baseline Document)
VDU	Video Display Unit
VHF	Very High Frequency
VS	Visibility Sensor

3.0 SYSTEM OVERVIEW AND DESCRIPTION – The DigiWx™ AWOS is a fully automated aviation weather observing and reporting system designed to support airborne and ground users. The DigiWx system is modular and may be installed in a number of configurations. A full DigiWx™ AWOS system consists of wind speed, wind direction, temperature, humidity, barometric pressure and visibility sensors mounted on a rugged, aluminum tilt-over tower. Sensor readings are monitored and processed by a digital processor located in the DCP enclosure. The processor uses sensor data to calculate the prevailing and gust wind components for pre-programmed runway headings. The DigiWx™ AWOS also calculates the altimeter setting, density altitude, condensation altitude, and dew point. All of this information plus the speed and direction of both prevailing wind and wind gusts, current surface temperature and visibility are broadcast on UHF 464 MHz by a FCC licensed transceiver located in the DCP enclosure. The system reports weather conditions to pilots in the air through the DigiWx™ AWOS Hand-Held Display Unit (HHDU). The pilot receives this information at ranges up to 10 miles from the airport. In order to get the weather information, the pilot only has to power up the hand held display and select the runway heading that he/she will use. In addition to alphanumeric readouts of the various weather parameters, the hand held unit provides a graphical representation of the selected runway with the head, tail and/or cross wind components displayed thereon. Through DigiWx Advisor and a Digital Data Receiver (DDR), the weather information and any NOTAMs can be communicated to users by Pilot Activated Unicom or an Endless Loop Dedicated Frequency (ELDF) on a dedicated VHF frequency. An internet option and dial up voice modem allow remote users to access the information. DigiWx™ AWOS system software design also incorporates plug and play simplicity for ease of installation and maintenance, and an intuitive interface for ease of operation.

Figure 1 illustrates a typical DigiWx installation with all sensor options installed and the solar power option added.



Interior DigiWx Data Acquisition Terminal Unit



Exterior DigiWx Tower

Figure 1

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The system is modular and may be deployed in a number of configurations depending on the sensors selected, the mounting method, and the output options as shown in the following table.

DigiWx Sensor and Data Distribution Configurations							
Data Distribution Options	Sensor Configurations						
		DCP Dual Baro Wall Mount	DCP Dual Baro Tower Mount	DCP Dual Baro Tower Mount Visibility Day/Night	DCP Dual Baro Tower Mount Wind Speed and Direction Temperature and Dew point	DCP Dual Baro Tower Mount Wind Speed and Direction Temperature and Dew point Visibility with Day/Night Sensor	DCP Dual Baro Wind Sock Mount Wind Speed and Direction Temperature and Dew point Visibility with Day/Night Sensor
	Code	BNT	B	BV	W	V	S
Handheld (HHDU) **	H	BNT-H	B-H	BV-H	BW-H	BWV-H	BWS-H
DigiWx Advisor – FBO	A1	BNT-A1	B-A1	BV-A1	BW-A1	BWV-A1	BWS-A1
DigiWx Advisor - FBO – Internet	A2	BNT-A2	B-A2	BV-A2	BW-A2	BWV-A2	BWS-A2
DigiWx Advisor - FBO – Dial In	A3	BNT-A3	B-A3	BV-A3	BW-A3	BWV-A3	BWS-A3
DigiWx Advisor - FBO – Internet - Dial In	A4	BNT-A4	B-A4	BV-A4	BW-A4	BWV-A4	BWS-A4
With							
DigiWx Voice – UNICOM	V1	BNT-A*-V1	B-A*-V1	BV-A*-V1	BW-A*-V1	BWV-A*-V1	BWS-A*-V1
Or							
DigiWx Voice VHF	V2	BNT-A*-V2	B-A*-V2	BV-A*-V2	BW-A*-V2	BWV-A*-V2	BWS-A*-V2

Table 1
Configurations Available

* DigiWx Voice requires the presence of one of the DigiWx Advisor modules – A1, A2, A3 or A4.

** All systems are supplied with one Hand Held Display Unit.

A solar power option is available for all configurations, and is denoted by appending "-SP" to the above designators.

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Details of the configurations in the shaded boxes in table 1 are listed as examples.

BNT-H	Dual Barometer DCP, wall mount, Handheld Receiver (HHDU)
B-A1	Dual Barometer DCP, Tower Mount, HHDU, DigiWx Advisor-FBO
BV-A3	Dual Barometer DCP, Visibility, Tower Mount, HHDU, DigiWx Advisor-FBO-Dial In
BW-A*-V1	Dual Barometer DCP, Tower Mount, Wind Speed and Direction, Temperature and Dew point, HHDU, DigiWx Advisor A1, A2, A3 or A4, DigiWx Voice on UNICOM
BWV-A*-V2	Dual Barometer DCP, Tower Mount, Wind Speed and Direction, Temperature and Dew point, HHDU, Visibility, DigiWx Advisor A1, A2, A3 or A4, DigiWx Voice on Dedicated VHF

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4.0 COMMISSIONING PROCESS OVERVIEW – In order for the system to become an FAA approved AWOS site installation a commissioning process must be completed. There are three phases to the commissioning process. They consists of: (1) Establishing a Memorandum of Understanding (MOU) and a site-specific Operations and Maintenance Manual (OMM) (2) Physical installation of the DigiWx™ AWOS hardware and software at the owner's site, and (3) Successful completion of a FAA conducted Commissioning ground inspection.

4.1 COORDINATING THE INSTALLATION WITH THE FAA – At least 120 days prior to the anticipated commissioning date, the owner should notify the FAA Regional Flight Standards District Office (FSDO) so that timely routine revisions may be made to the instrument approach procedures. Owners also need to contact and coordinate their installation plans be with the FAA regional non-Federal facilities program manager and follow the procedures provided (this person may be called the non-Federal coordinator in some regions). This FAA person is the official FAA point of contact and is responsible for the overall project coordination between the sponsor (owner) and other elements within the FAA. Coordination will include preparation and submittal of FAA forms 7460, "Notice of Proposed Construction or Alteration." Refer to Appendix A for forms, requirements and instructions for completing and submitting these forms.

FAA (Order 6700.20) requires that a Memorandum of Understanding (MOU) and a site-specific Operations and Maintenance Manual (OMM) be established and agreed to between the sponsor (owner) and the FAA prior to commissioning the AWOS installation for public use. The purpose of the MOU/OMM is to ensure that there is a mutual understanding of what is required to operate and maintain a commissioned AWOS system. After the AWOS site installation is complete and the MOU/OMM is signed, the FAA will conduct a commissioning ground inspection to verify that the system is installed and operating correctly and that the owner has the resources and procedures in place to properly maintain the system. In addition, a flight inspection is required for NAVAIDS used for AWOS dissemination.

As installation approaches operational readiness, the owner should request a commissioning ground inspection by Regional Airway Facilities (AAF) personnel. This inspection includes participation by the owner or the owner's maintenance representative. This commissioning inspection includes tests and checks of the operational readiness of the AWOS system installation and also includes recording of initial facility performance data which should be retained in the facility reference data file (FRDF).

4.2 ESTABLISHING SITE-SPECIFIC OPERATIONAL PROCEDURES – FAA Order 6700.20 requires that a Site-specific Operational Maintenance Manual (OMM) be established and the content agreed to by the FAA prior to commissioning of an AWOS system for public use. The purpose of this manual is to ensure there is a mutual understanding of what is required to operate and maintain a commissioned AWOS system. The required content of this manual is specified in FAA circular AC 150/5220-16C Section 12.d. The following items should be covered:

- Physical security of the facility
- Personnel to contact if a weather parameter is found to be out of tolerance or system maintenance is needed
- Posting of licenses and signs
- Notice to the FAA

- How to keep station logs and other technical reports and documentation
- Procedures to be followed for periodic scheduled maintenance or shutdown.
- Procedures to be followed to freeze AWOS data in the archive file after an aircraft accident or incident.
- Locations of AWOS components on the airport
- Copy of the signed MOU between the owner and the FAA

The system owner should work closely with the "FAA regional non-federal facilities program manager" to assure the content of this manual is agreed to prior to the commissioning inspection.

4.3 PERFORMANCE TESTS AND INSTALLATION CHECKOUT – Prior to the FAA commissioning inspection, approved maintenance personnel should verify the functionality of the installation. All applicable operating requirement parameters identified in Chapter 4 of AC 150/5220-16C should be measured and documented to assure the system is performing within the tolerances specified. Refer to the DigiWx Maintenance Manual, Appendix A, and document these preliminary performance verifications on a "Comprehensive Facility Performance and Adjustment Record" form.

4.4 FACILITY COMMISSIONING AND INSPECTION – The facility commissioning inspection is a formal FAA ground inspection of the AWOS site installation. The completion of this event assures and demonstrates to the FAA that the system has been installed correctly and is operating in accordance with specified performance requirements. It consists of demonstration that the system is operational and performing within the operating tolerances specified in Chapter 4 of FAA circular AC 150/5220-16C and includes participation of the system owner's FAA approved maintenance representative. The owner's maintenance personnel should operate the system and measure all applicable system performance parameters as identified in Chapter 4 of AC 150/5220-16C. The results of this initial commissioning performance parameter measurements shall be recorded and documented on the "Comprehensive Facility Performance and Adjustment Data" form (similar to FAA Form 6030-17) and must be retained at the facility in the Facility Reference Data File (FRDF). If the installed system uses the voice outlet of the local NAVAID to broadcast weather information, the commissioning inspection will also include a flight inspection to ensure that the performance of the NAVAID has not been degraded as a result of the AWOS installation. To facilitate successful completion of the commissioning, owners should have the following documents and items readily available during the inspection:

- The FAA agreed to Memorandum of Understanding, MOU
- A copy of the FAA Type Approval letter, sent to Belfort Instrument, granting approval of DigiWx AWOS system design.
- A copy of the documentation from the FCC assigning the approved operating frequencies (if applicable)
- The site-specific operations and maintenance manual (OMM), which have been agreed to by the FAA.
- All test equipment required for maintenance and needed to measure all applicable system performance parameters. All test equipment must be calibrated and show evidence of current calibration traceable to national standards.

4.5 FACILITY REFERENCE DATA FILE (FRDF) DOCUMENTATION – The FRDF file should contain all of the documentation identified in Section 12 of FAA circular AC 150/5220-16C:

- Copy of FAA Type approval letter for the DigiWx system being installed.
- Frequency Allocation Approval from the FCC
- Copy of this Installation and Checkout Manual, Copy of the Belfort DigiWx Maintenance Manual and System description manual.
- Copy of the site specific Operational Maintenance Manual, OMM
- Initial commissioning documentation of facility performance and adjustment data to include measured performance data and respective standard or reference values.

This file must be kept current and be available for FAA review at any time.

5.0 QUALIFICATION REQUIREMENTS FOR INSTALLATION AND MAINTENANCE PERSONNEL – Installation and maintenance of the DigiWx™ AWOS system must be performed by qualified personnel. FAA Order 6700.20A contains the qualification requirements for maintenance personnel who maintain Non-Federal facilities. A Belfort Instrument trained technician or a technician verified by the FAA may install and maintain the system. The AWOS maintenance program is the responsibility of the system owner. Installation and maintenance personnel should have the special knowledge and skills needed to maintain a DigiWx™ AWOS facility. These skills can be obtained by completing the Belfort Instrument "DigiWx™ Installation and Maintenance Training Program" course and successfully passing the performance examination. Owners or maintenance technicians interested in scheduling this training should contact the Belfort Instrument DigiWx program manager at 1-800-937-2353 to schedule this training. In addition, the FAA will may give a practical exam to any DigiWx technician to assure the technician is qualified to perform system maintenance.

6.0 SELECTION OF SITE LOCATION – The site for installing the DigiWx™ AWOS should be carefully selected, in accordance with FAA Order 6560.20B. There are several factors that will impact the cost of installation and maintenance and could impact system performance.

1. The DigiWx™ AWOS tower is 15 feet tall, an illustration of the DigiWx tower is shown in Figure 2. Therefore, the unit should be located far enough away from runways and taxiways to provide adequate clearance for aircraft landings, take-offs or while aircraft are taxiing in the vicinity of the DigiWx™ AWOS tower.
2. If the tower is to be supplied with commercial electric power, it should be located as close to the power source as possible and the power service should be installed by the site contractor to be within three (3) feet of the base of the DigiWx tower. Junction box will be provided by Belfort. Trenching for power service should comply with NEMA codes and all local electrical codes or ordnances that may apply.
3. In order to obtain accurate wind speed and direction measurements, the DigiWx™ AWOS should not be located close to buildings, trees or other obstructions. Best operational performance will be obtained if there are no obstructions within 500 feet of the DigiWx™.

6.1 SAFETY PRECAUTIONS

1. Do not perform any DigiWx™ AWOS site preparation operations during inclement weather particularly during electrical storms.
2. Always contact the local agency capable of identifying the location of underground utilities prior of commencing any excavation operations.
3. Have all A/C power installations and connections performed by a fully qualified electrician.

6.2 SITE PREPARATION AND INSTALLATION OPTIONS: - The following installation instructions apply to tower mounted systems.

6.2.1 TOOLS REQUIRED FOR SITE PREPARATIONS:

Power drill and ½" drill bit.
Socket wrench set including: 13/16", ¾", 5/16" and 3/8" sockets
Carpenter's level
#2 Phillips head screwdriver
Allen Wrench (3 mm supplied with Hardware Kit)
Allen Wrench, 3/16”
¼ Straight/slot-head screwdriver
Hand Bearing Compass, Lensatic
8' Step Ladder
1 1/16" – 1 1/8" hole saw with pilot drill
Laptop computer with communication/RS232 interface

6.2.2 INSTALLATION ON UNPAVED GROUND – The DigiWx™ AWOS can be easily installed on unpaved ground. Site preparation consists of burying an 8 foot aluminum mounting channel (P/N 80021) to a depth of 4 feet below ground level.

1. Dig or auger a hole at least 4 feet in depth and 12 inches in diameter.
   NOTE: If the local frost depth is 4 feet or greater, the depth of the hole should be at least 6 inches below the frost depth and the aluminum channel appropriately longer to assure 4 feet extension above ground level.
2. Place the 8 foot aluminum channel in the hole and align a 6" side to face true north as described below:
3. With the aluminum channel (P/N 80021) standing in the hole, place the magnetic compass on the end, aligned with the north facing edge of the aluminum channel (P/N 80021), and rotate the aluminum channel (P/N 80021) until the compass indicates true north, taking into account local variation or declination.

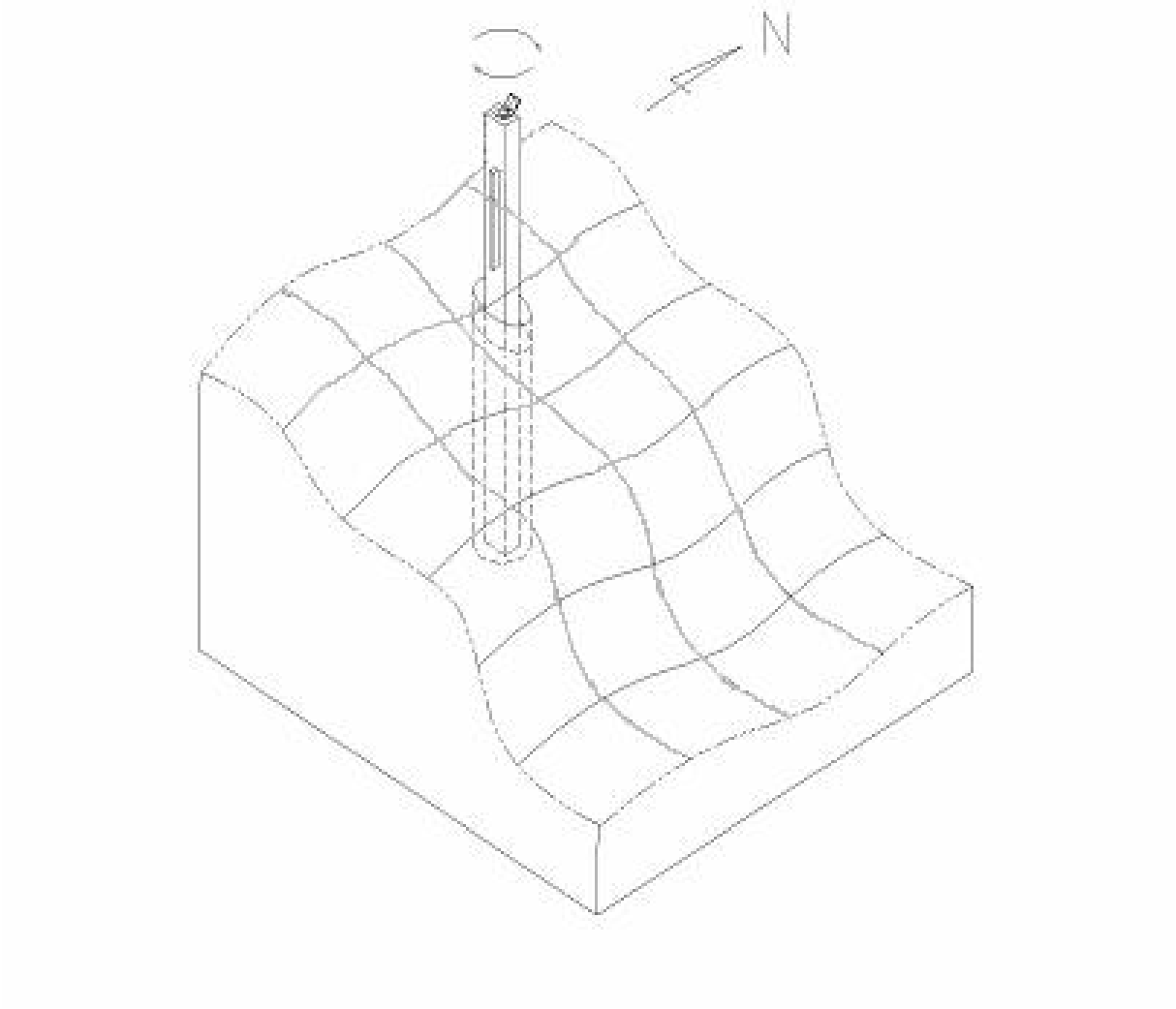

Figure 2
Typical Alignment of Tower Mounting Post

4. Use a carpenter's level to align the aluminum channel (P/N 80021) vertical to the ground.
5. Secure the aluminum channel (P/N 80021) in this alignment.
6. After securing the aluminum channel (P/N 80021), check both the true north and vertical alignments and adjust if necessary.
7. While holding the aluminum channel (P/N 80021) in alignment, fill the hole with concrete to ground level. Immediately after pouring the concrete, recheck both the true north and vertical alignments and adjust if necessary.
8. Leave the alignment holding arrangement in place until the concrete is set.
9. When the concrete is set, remove the alignment holding arrangement and verify that one 6" side of the aluminum channel (P/N 80021) still faces to true North.
10. Mark the north facing side of the aluminum channel (P/N 80021) with the letter "N" using paint or a permanent marker.
11. As a condition of the DigiWx sale, the airport/owner will coordinate the physical site location of the DigiWx tower on the airfield with the local Flight Standards District Office (FSDO).

6.2.3 INSTALLATION ON FLAT METAL, PAVED OR WOOD SURFACE – The DigiWx™ AWOS can be installed on any flat metal or wood surface by securing the appropriate mounting bracket to the selected surface. The Belfort Instrument Company must be consulted to review the particular installation and provide a recommended mounting method.

6.3 INSTALLATION OF TRUE NORTH MONUMENT - As a further condition of the DigiWx sale, the airport/owner is charged with providing a certificate of site survey for field elevation and installation of a permanent true North marker positioned 100 - 150 feet North of the physical site where the tower will be located. A concrete monument, 5 inches square at the top, 30 inches long, buried in the ground so that 1 inch extends above ground level is available from:

Precast Concrete Sales Company
123 Route 303
P.O. Box 516
Valley Cottage, NY 10989
Phone: 845-268-4949
Fax: 845-268-4376
Marker Part Number: 21-2 or equivalent

6.4 LIGHTNING PROTECTION AND GROUNDING REQUIREMENTS - Installation of the DigiWx tower must also include a lightning and grounding system: This system consists of a 5/8 inch diameter x 6 foot aluminum lightning rod mounted to the tower affording a 45 degree cone of protection, coupled through a bimetallic coupling to a 4/0 stranded bare copper down conductor to the site earth ground system.

The site earth ground system shall consist of 3 each 10 foot long, ¾ inch diameter copper clad steel rods driven to a depth such that the tops of the rods are at least 18 inches below local grade. The rods shall be positioned in an equilateral triangle with 20 foot sides and connected with 1/0 bare stranded copper wire. All connections shall be CadWeld or commercial equivalent.

The site earth ground system must also be connected to any adjacent grounding system within 30 feet of the DigiWx installation with 1/0 bare copper conductor.

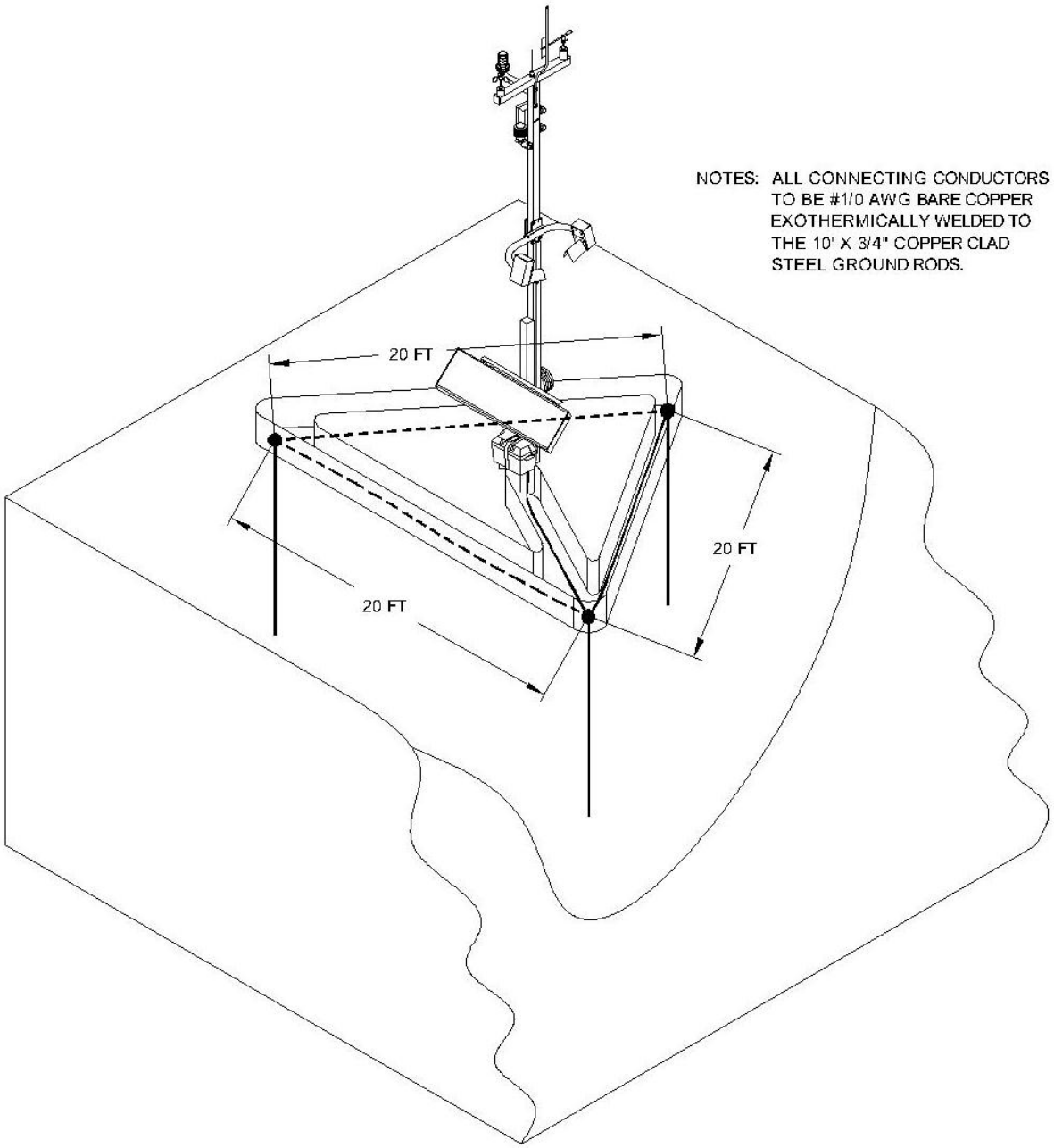
NOTES: ALL CONNECTING CONDUCTORS TO BE #1/0 AWG BARE COPPER EXOTHERMICALLY WELDED TO THE 10' X 3/4" COPPER CLAD STEEL GROUND RODS.
20 FT
20 FT
20 FT

Figure 3
Installation of Earth Grounding System

7.0 Hardware Installations – All DigiWx™ AWOS systems except the Dual Barometer pressure reference only versions (BNT-*) are mounted on a 15 foot fold over tower.

This photo illustrates the installation of the DigiWx DATU at an operational site
Figure 4

7. 1 PARTS AND HARDWARE

PARTS LIST

ITEM	PART #	DESCRIPTION	QTY	INSTALLATION REF
1	80010	Instruction Manual	1	-
2	80035	HHDU User Manual	1	-
3	6795-01	Hand Held Receiver	1	-
4	80089	Pole and Harness	1	Figs 5, 6, 7, 15, & 16
5	80018	Computer and Monitor	1	Fig 18
6	22167	Cross Arm	1	Figs 5a & 7
7	22168	Channel	1	Fig 6
8	6794-01	DCP Enclosure Assy	1	Fig 8
9	80014	Wind Speed Bottle	1	Fig 10
10	80015	Wind Direction Bottle	1	Fig 11
11	80016	Wind Speed Cups	1	Fig 10
12	80017	Wind Direction Vane	1	Fig 11
13	ZXSRS8HC	Solar Radiation Shield	1	Fig 12
14	R13HYCLIPS3	Temperature/Humidity Sensor	1	Fig 12
15	ZXMUF4502	Antenna	1	Fig 5a
16	8720-01	Harness, Tower	1	Fig 5
17	8721-01	Harness, Power	1	Fig 5a
18	8728-01	Cable, Antenna	1	Fig 5a
19	ZX1324U2	Cap, End	2	Fig 10 & Fig 11
20	ZX1242DPCHR	Eye Strap	1	Fig 5a
21	80003	Battery Bracket	1	Fig 15
22	80003-1	Battery Box	1	Fig 16
23	80003-2	Solar Panel	1	Fig 14
24	80057	Solar Panel Mounting Kit	1	Fig -
25	ZXRPG125	Weights	3	Fig 5
26	ZX3827T34	Nylon Rope	1	Fig 6
27	ZX4491K42	Cap Plug, Red	6	Fig 10 & Fig 11
28	ZXS56	Solar Controller	-	Fig 16
29	SCP30S15DN	Power Supply	1	Fig 17
30	ZXA8R84	Junction Box and circuit breaker	1	Fig 17
31	80152	Battery backup power cable	1	Fig 17
32	80009	Ground Cable	2	Figs 6 & 17
33	80090	Lightning Rod	1	Fig 5a
34	80097	Mounting Plate	1	Fig 13
35	80091	Data Comm Cable	1	-
36	80087	DCP Mounting Kit	2	Fig 9
37	90000	Visibility Sensor	1	Fig 13
38	80098	Hardware Kit, Visibility meter	1	Fig 13
39	92000	Day Night Sensor	1	Fig 13
40	SFL612100	Power Supply	1	Fig 17
41	SFL612100	Power Supply	1	Fig 17
42	LPC 10262-7	Surge Suppressor	1	17

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ITEM	PART #	DESCRIPTION	QTY	INSTALLATION REF
43	80040	DDR & Power Supply	1	Fig 19
44	80041	DDR Comm Cable	1	Fig 19
45	80039	RIF	1	Fig 19
46	90001	Calibration Kit	1	--
47	80109	Obstruction Light and wiring harness kit	1	Fig 5a
48	80110	Base Transceiver	1	Fig 5a
49	80111	Pressure Vent Kit	2	Fig 5a
50	80113	ELDF Base Transceiver	2	Fig 5a
51	80156	MCIF	1	Fig 19

-HARDWARE PACKAGE KIT -			**PART NUMBER 80033**			
				WASHERS		
ITEM	**PART NBR**	**FASTENER**	**QTY**	**FLAT**	**LOCK**	**NUT**
H1	80022	Socket Head Screw, M4 x 8	6	6	6	-
H2	80023	Hex Head Bolt, ¼-20 x ¾	11	11	11	-
H3	80025	Flat Head Screw, #8-32 x ½	2	-	-	-
H4	80026	Pan Head Screw, #8-32 x ½	4	4	4	-
H5	80027	Hex Head Bolt, 3/8-16 x 1	6	6	6	-
H6	80028	Hex Head Bolt, 3/8-16 x 6	1	3	2	2
H7	80030	Hex Head Bolt, ½-13 x 7	2	4	-	4
H8	80031	Lag Bolt, ¼ x 1¼	1	1	-	-
H9	80032	Lag Bolt, 5/16 x 4½ *	4	*	*	*

* Extra Hardware for Solar Panel and Mounting

Table 2

7.2 TOOLS REQUIRED FOR HARDWARE INSTALLATIONS

1. Common hand tools (i.e., wrenches, screwdrivers, nut drivers)
2. Digital multi-meter (DMM) Fluke 77 or equivalent
3. Notebook computer with DB9 serial interface
4. PROCOMM software PROCOMM Plus, Datastorm Tech or equivalent
5. Portable pressure standard Model 760-16B, (Paroscientific, Inc)
6. Visibility sensor calibration kit 32041, (Belfort Instrument Company)
7. Magnetic compass S&Y 183, Stocker and Yale or equivalent
8. Kestrel Model 3000 Wind Instrument with calibration kit
9. Scanner w/AC Adapter Radio Shack PRO 36/273-1455 or equivalent
10. Wire brush (Commercial)
11. Scraper, w/razor blade (Commercial)
12. Gloves, rubber (Commercial)
13. Techni-Tool TECH DUSTER inert dusting gas or equivalent
14. Battery Terminal cleaning brush (Sears P/N 00947697000 or equivalent)
15. Wooden tongue depressors (to be used to remove debris from DCP pressure ports)

7.3 TILT-OVER TOWER ASSEMBLY & INSTALLATION

SAFETY PRECAUTIONS

1. **Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Power drill and ½" drill bit
2. Two (2) bolts, Four (4) flat washers, four (4) nuts, (Item H7, P/N 80030)
3. Socket wrench and 13/16" socket
4. Carpenter's level

INSTALLATION INSTRUCTIONS

1. Determine the face of the buried aluminum channel (P/N 80021) post that faces north.
2. Attach the hinged section of the tilt-over tower to the north face of the aluminum channel (P/N 80021) post using the bolts and washers provided (Item H7, P/N 80030). As shown in Figure 4, install a nut and washer on one of the bolts and run the nut down the bolt until 4½" of thread remains above the washer. This will ensure that you will be able to access the bolt head with a 13/16" socket in order to tighten the nut on the south face of the aluminum channel (P/N 80021) post. Insert this bolt through the upper mounting bolt access hole in the lower half of the tilt-over tower as shown in Figure 4. Now attach the tower to the north face of the aluminum channel (P/N 80021) post by inserting the bolt through the ½" hole and tighten snugly.
3. Using a carpenter's level, ensure that the lower section of the tilt-over tower is vertical. Holding the tower section vertical, mark the position of the bottom mounting bolt hole. Rotate the tower out of the way and drill the second ½" hole through the aluminum channel (P/N 80021) post at that point.
4. Rotate the lower section of the tilt-over tower back to vertical being careful not to pinch the wiring at the hinge point. Insert the bottom mounting bolt, install a nut and washer on one of the bolts and run the nut down the bolt until 4½" of thread remains above the washer (H7, P/N 80030), as shown in Figure 4.
5. NOTE: DO NOT INSTALL NUT AND WASHER ON THE SOUTH SIDE OF THE aluminum channel (P/N 80021) POST AT THIS TIME!
6. Figure 5 illustrates the lower portion of the tilt-over tower.

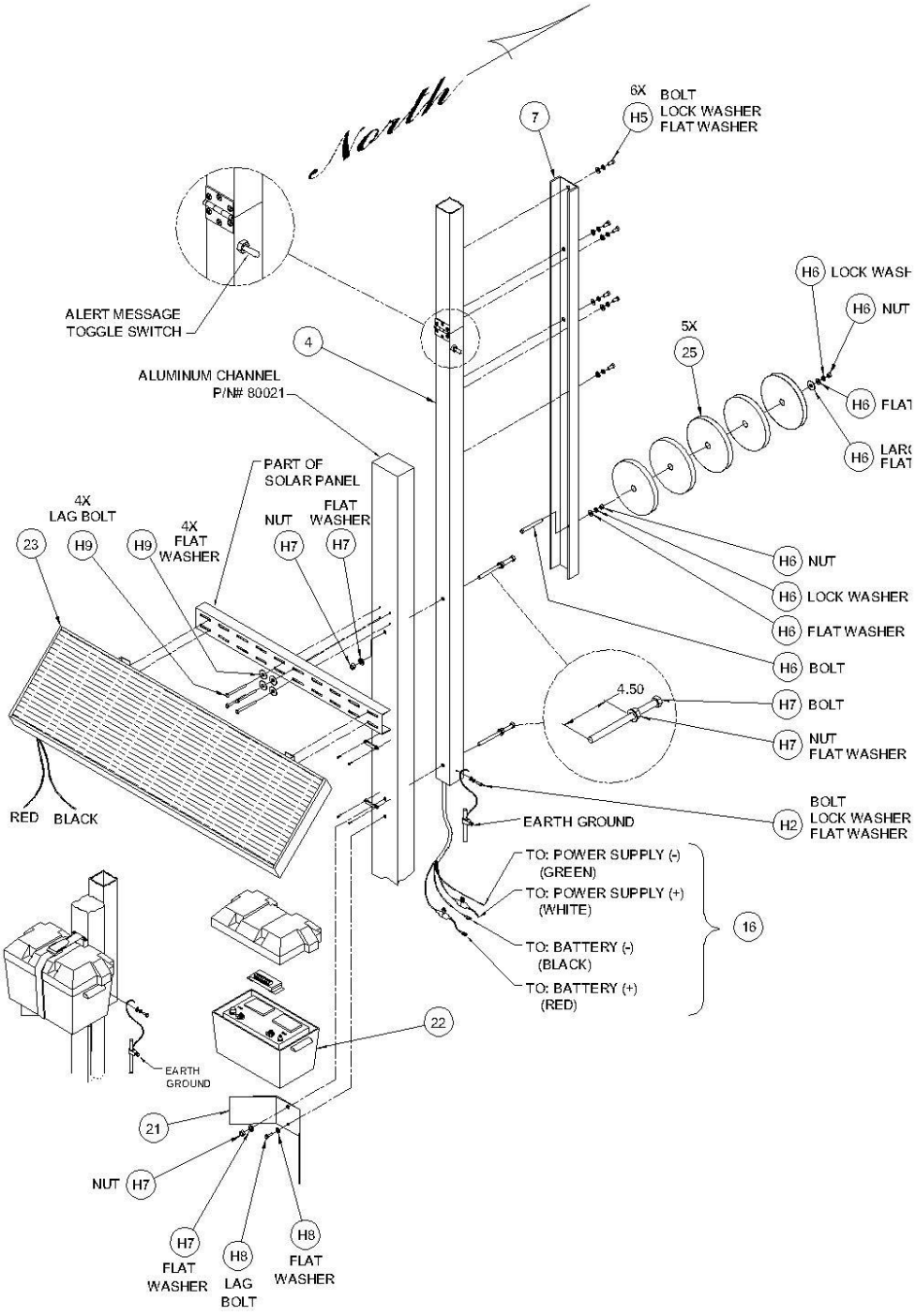

Figure 5 – Tilt-Over Tower Assembly & Installation
(Lower Portion)

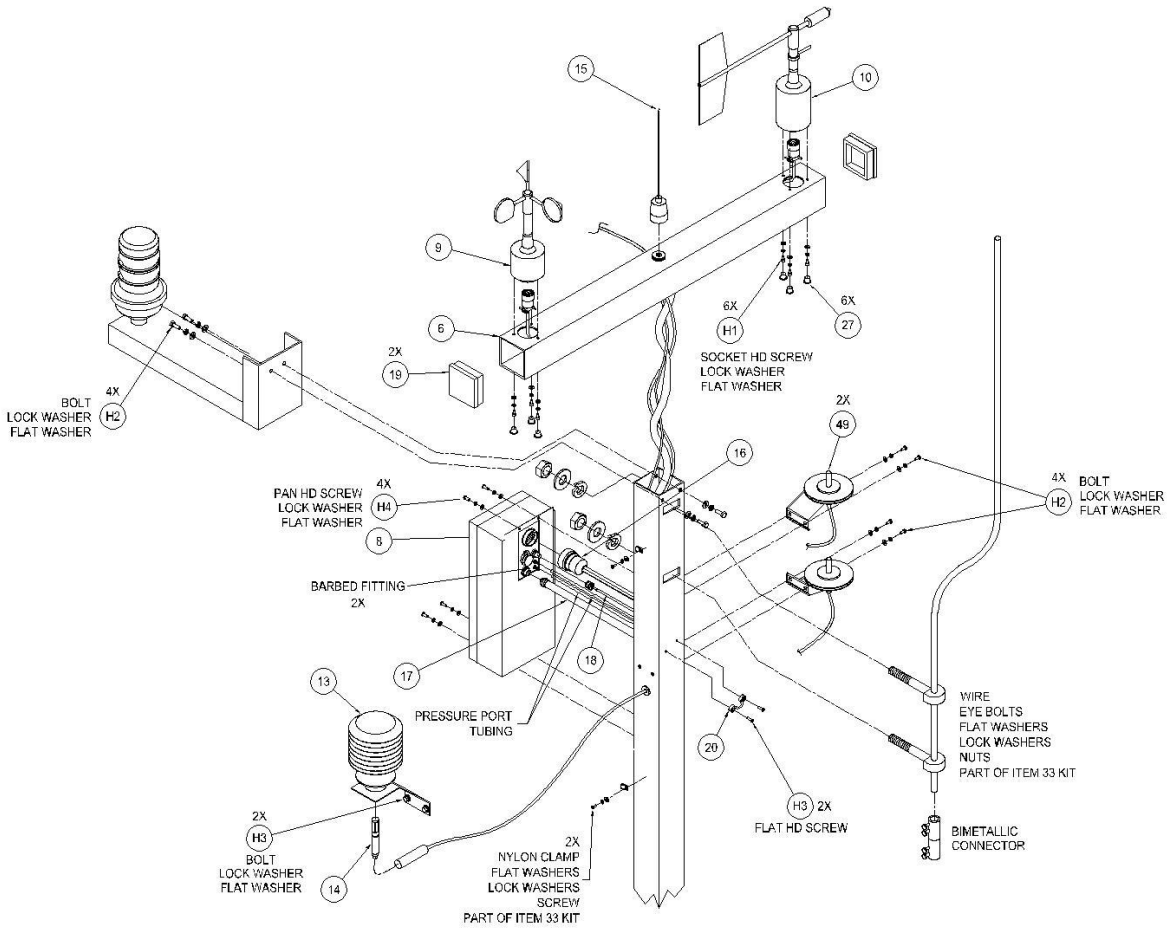

Figure 5a – Tilt-Over Tower Assembly & Installation
(Upper Portion)

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7.4 INSTALLING TOWER CHANNEL SECTION, BALANCE WEIGHTS AND LIGHTNING ROD

SAFETY PRECAUTIONS

1. **Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Tower channel section (Item 7)
2. Six 3/8-16 x ¾ hex head bolts and washers (Item H5, P/N 80027)
3. Two 8-32 x ½ flat head screws (Item H3, P/N 80025)
4. Nylon rope (Item 26)
5. Eye Strap (Item 20)
6. Balance weight mounting bolt, nut and washers (Item H6, P/N 80028)
7. Five 12.5 lb. Weights (Item 25)
8. Lightning Rod Kit (Item 33, P/N 80090)

INSTALLATION INSTRUCTIONS

1. Locate the channel (Item 7) and attach it to the upper half of the hinged section of the tilt-over tower with three (3) hex head bolts and washers (Item H5, P/N 80027) as shown in Figure 2.
2. Locate the eye strap and attach it to the upper half of the hinged section using the two (2) tapped holes and two (2) flat head screws provided (Item H3, P/N 80025).
3. Feed the 3/8" nylon rope through the rope bail and tie a stopper knot at the end as shown in Figure 6.
4. Insert balance weight mounting bolt (Item H6, P/N 80028) through the hole near the bottom end of the channel section. Install washers & nut and tighten as shown in Figure 6.
5. Locate the lightning rod, two (2) 3/8-16 x 4½ eye bolts, nuts and washers, twenty-five (25) feet 32/17 braided copper wire, the Bimetallic Connector and the eight (8) ground wire securing clips which are all part of Item 33, P/N 80090. Secure the lightning rod to the tower using the two (2) eyebolts, nuts and washers with the upper portion of the rod bending away from the tower as shown on Figure 6. Attach one end of the down conductor to the bottom of the lightning rod using the Bimetallic Connector. Route the grounding wire down the tower, securing every two (2) feet with the clips and fasteners supplied. Route the grounding wire to the earth ground system and secure with a wire clamp, making sure any wire bends have a radius of at least 8 inches. Trim any excess grounding wire.
6. Erect the tilt-over tower and hold it in place by installing the lower one of the three (3) tower securing bolts (Item H5, P/N 80027) and tighten finger-tight. NOTE: Do not over-tighten the tower-securing bolts since excessive torque may damage the threaded inserts. Use care when erecting the tower and ensure that the wiring routed inside the hinged tower section is not being pinched at the hinge point.

7. Place the five (5) 12.5 lb. weights provided over the balance-weight mounting bolt and secure with hardware (Item H6, P/N 80028) as shown in Figure 6.

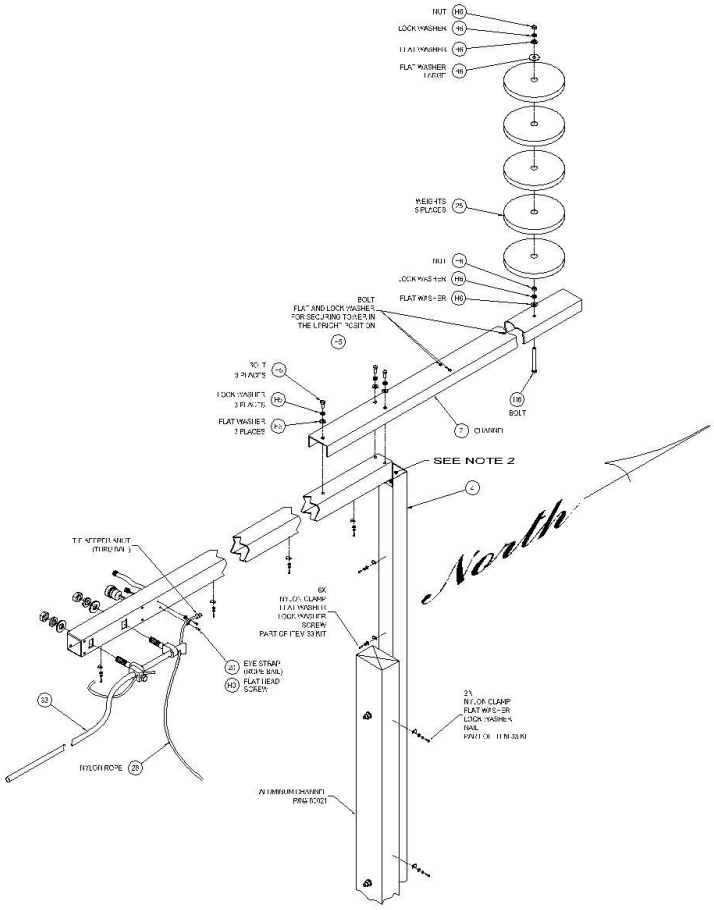

Figure 6 – Installing Tower Channel Section and Balance Weights

7.5 INSTALLING CROSS ARM ASSEMBLY AND OBSTRUCTION LIGHT

SAFETY PRECAUTIONS

1. **Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Cross arm assembly (Item 6)
2. Four (4) cross arm mounting bracket bolts and lock washers (Item H2, P/N 80023)
3. Socket wrench and ¾" socket

INSTALLATION INSTRUCTIONS

1. Remove tower-securing bolts and pull the tower down to the point where the top of the tower is at a comfortable working height and secure it in that position by tying the nylon rope around the aluminum channel (P/N 80021) post.
2. Untangle the wind sensor cables from the wiring harness in the upper section of the tilt-over tower and locate the markers on the cable ends that identify them for the "wind direction" and "wind speed" sensors, respectively.
3. Locate the cross arm assembly. Route the radio antenna cable out through the cross arm and the cross arm adapter bracket.
4. Route the antenna cable through the upper section of the hinged section and out through the cutout for the electronics enclosure.
5. Route the obstruction light power cable out through the tower hole and install the protective rubber grommet.
6. Route the two sensor cables through the cross arm adapter bracket and out the ends of the cross arm. The wind direction cable must be routed out the right side of the cross arm and the wind speed sensor cable is routed to the left as viewed from the sensor side (top) of the cross arm.
7. Using two (2) of the bolts and washers provided (Item H2, P/N 80023), mount the cross arm to the upper half of the hinged tower section as shown in Figure 3.
8. Using the other two (2) bolts and washers, secure the obstruction light mounting bracket with obstruction light to the tower. This will also complete the attachment of the cross-arm.
9. Figure 7 illustrates the details of the cross-arm assembly. Figure 8 illustrates the details of the obstruction light.

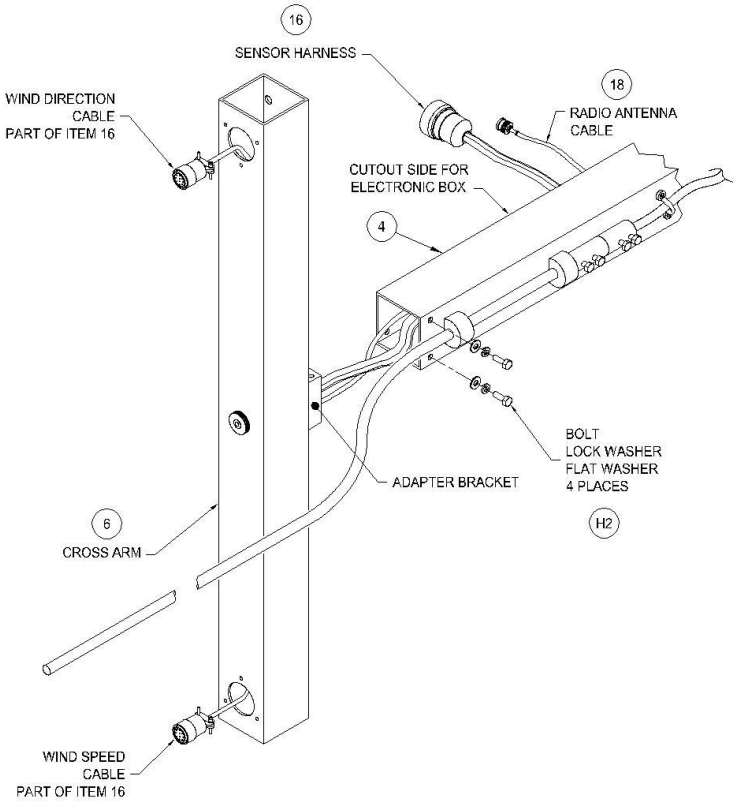

Figure 7 – Installing Cross-Arm Assembly

7.6 INSTALLING DCP AND BAROMETER ENCLOSURE

SAFETY PRECAUTIONS

1. **Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. DCP enclosure (Item 8)
2. Fold Over Tower with all cabling preinstalled
3. Data Communication Cable (Item 35)
4. Four 8-32 x ½" Pan head screws (Item H4, P/N 80026)
5. Phillips head screwdriver
6. Two each static pressure vents (Item 49, P/N 80111)
7. Phillips head screwdriver
8. Four ¼-20 x ¾ bolts with washers (Item H2, P/N 80023)
9. Socket wrench and ¾" socket

INSTALLATION INSTRUCTIONS

Note: Installation of the DCP requires prior installation of the static pressure port vents onto the tower.

1. Locate the static pressure ports with brackets and hoses.
2. Align bolt holes in the mounting brackets with the drilled and tapped holes on the sides of the tilt-over tower as shown in Figure 5.
3. Secure the vents to the tilt-over tower using four (4) bolts and washers (Item H2, P/N 80023) provided.
4. Slip one end of each ¼" diameter hose over the barbed fitting on the bottom of the vent (See Figure 5)
5. Insert the other end of each hose through the grommet holes into the interior of the tower and feed them up and out through the DCP cutout. Form a drip loop in each hose to retard moisture entry into the tower.
6. Locate the DCP enclosure and connect the following to the receptacles on the back of the enclosure as shown in Figure 8: the antenna cable, power cable, 9-pin communication cable and sensor harness from the cut-out in the upper half of the hinged tower section. Connect both of the ¼" hoses from the static pressure vents to the bulkhead barbed fittings located on the back of the DCP below the antenna connector. It does not matter which hose attaches to which fitting. If there are no additional sensors, fold and store the sensor harness in the tower above the DCP access cutout.

NOTE: All of the connectors and their respective receptacles are keyed.

7. Secure the enclosure to the tower with four (4) Pan head screws, lock washers and flat washers provided (Item H4, P/N 80026).

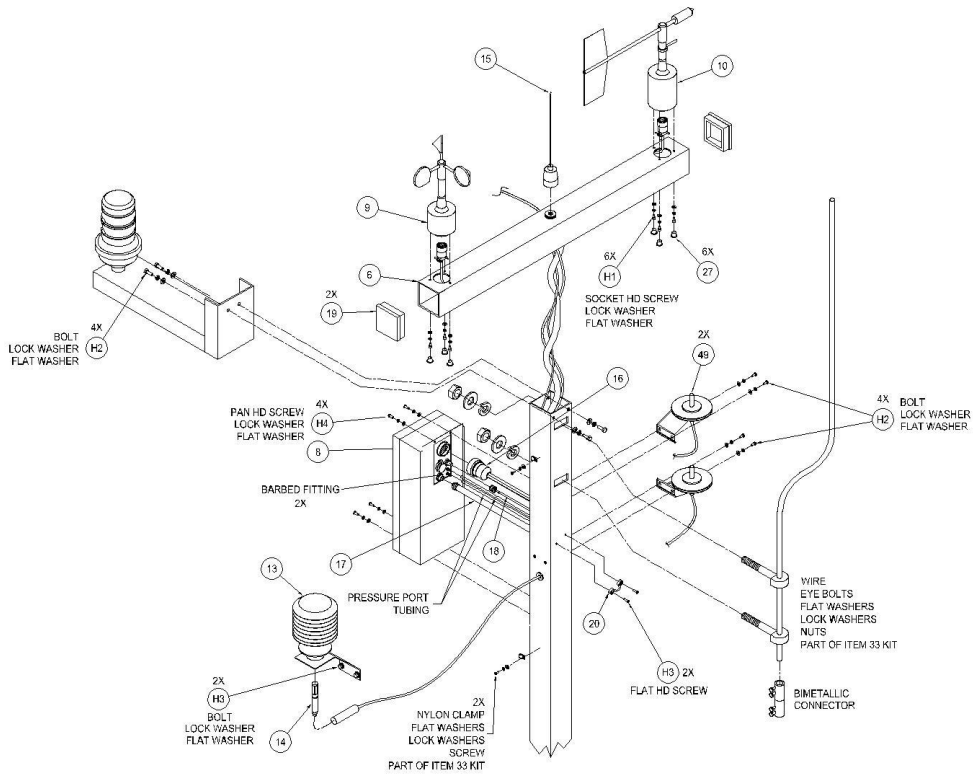

Figure 8 – Installing DCP Electronics Enclosure

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7.7 INSTALLING DCP AND BAROMETER ENCLOSURE (NO TOWER CONFIGURATION)

SAFETY PRECAUTIONS

1. **Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Electronics enclosure (Item 8)
2. Two DCP mounting brackets and power harness (Item 36, P/N 80097)
3. Four 8-32 x ½" Pan head screws (Item H4, P/N 80026)
4. Phillips head screwdriver
5. Wire clips procured locally to suit use.
6. Data Comm Cable (Item 35, P/N 80091)

INSTALLATION INSTRUCTIONS

1. Mount the two DCP mounting brackets to the DCP using the four pan head screws.
2. Mount the antenna to the upper bracket in the cutout provided.
3. Connect the antenna cable and power cable to the receptacles on the back of the enclosure as shown in Figure 8. NOTE: All of the connectors and their respective receptacles are keyed.
4. The DCP enclosure should be installed in a convenient location on the building exterior wall approximately 12 feet above ground level facing East or at a level to assure clearance above any possible accumulation of snow as shown in Figure 9.
5. Route the Data Comm Cable and Power Harness down the wall and secure every two (2) feet with the wire clips.
6. See Section 7.15 and Figure 19 for detailed installation of AC power and battery backup that are illustrated in Figure 9.

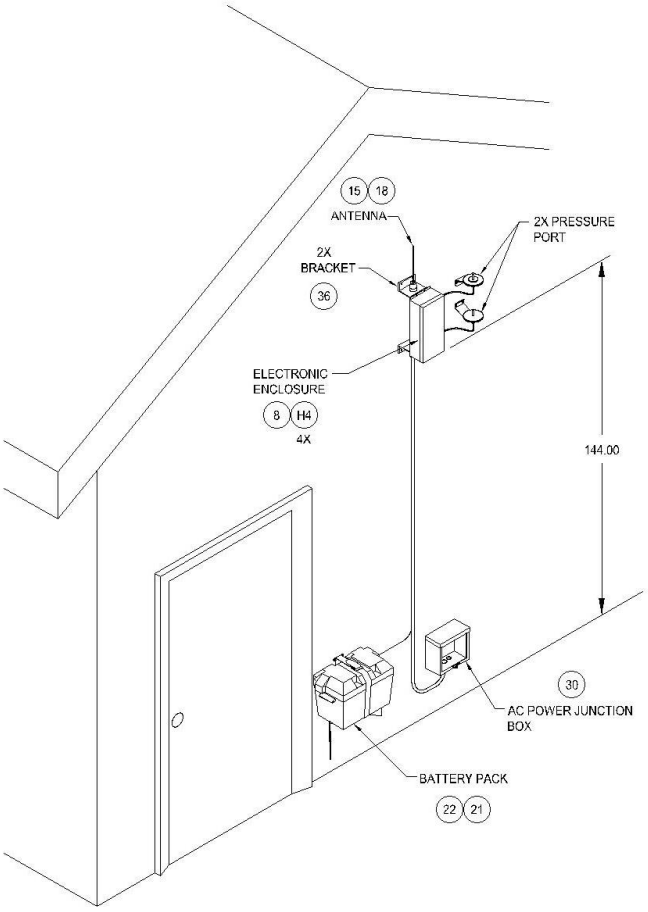


Figure 9 – Installation of DCP and Barometer Enclosure (no tower configuration)

7.8 INSTALLING WIND SPEED SENSOR

SAFETY PRECAUTIONS

1. **Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Wind speed sensor (Item 9)
2. Three (3) M4 x 8, Socket head screws (Item H1, P/N 80022)
3. 3 mm Allen wrench
4. End Cap (Item 19, P/N ZX1324U2)
5. Three (3) hole plugs (Item 27, PN ZX4491K42)

INSTALLATION INSTRUCTIONS

1. Reference Figure 10.
2. Locate the wind speed sensor and remove the three (3) screws installed in the bottom of the sensor and discard.
3. Remove the knurled protective collar from the sensor connector flange and discard.
4. Route the wind speed sensor cable through the cutout in the top of the left side of the cross arm.
5. Carefully insert the keyed cable connector into the sensor and hand tighten completely.
6. Insert sensor with the cable attached through the cutout in the top of the cross arm and secure with three (3) Socket head screws (Item H1, P/N 80022) using the Allen wrench provided.
7. Insert the End Cap (Item 27) into the end of the cross arm and tap into place. Insert the three (3) hole plugs in the bottom of the cross arm to cover the screw access holes.

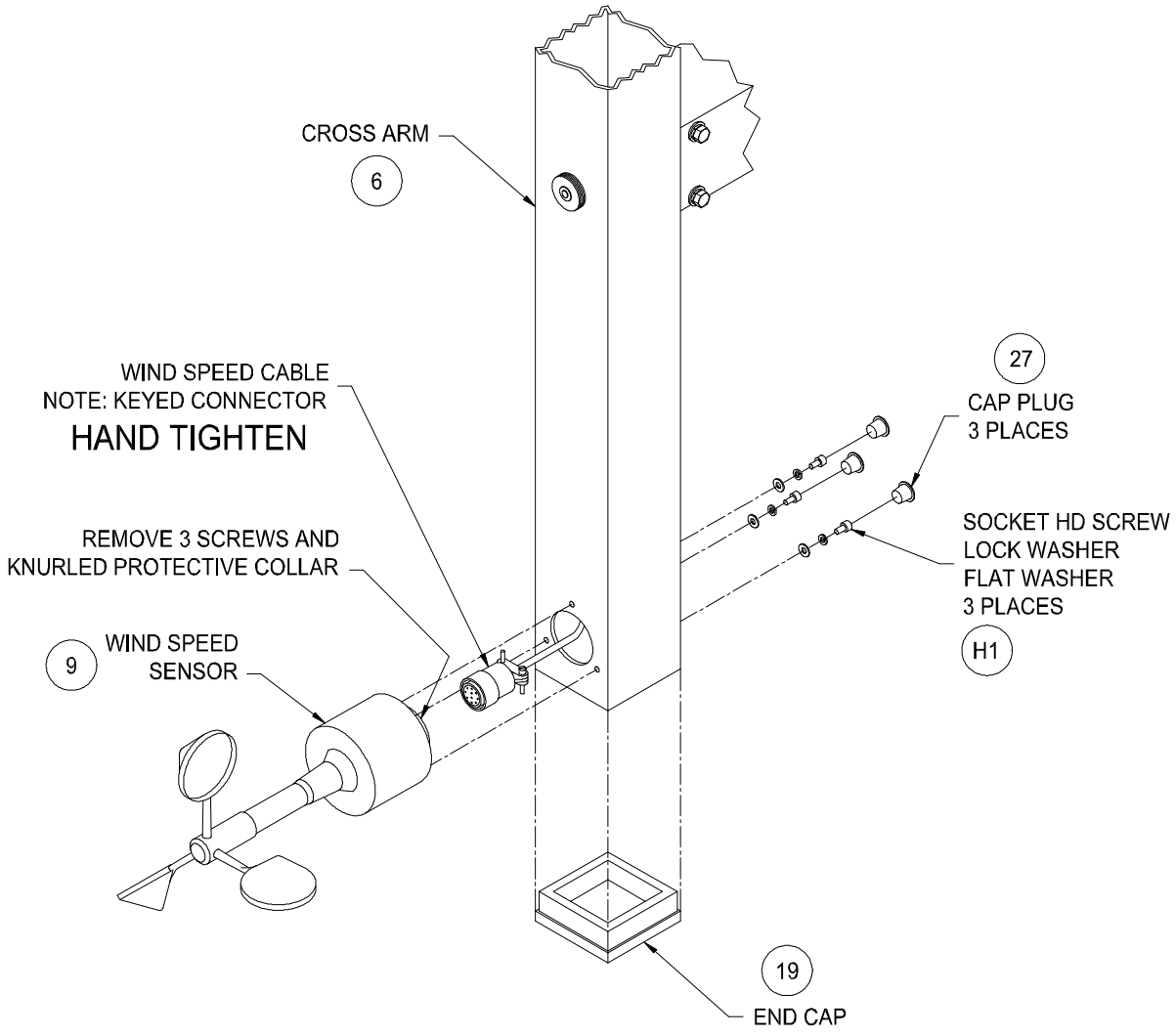


Figure 10 – Installing Wind Speed Sensor

7.9 INSTALLING WIND DIRECTION SENSOR

SAFETY PRECAUTIONS

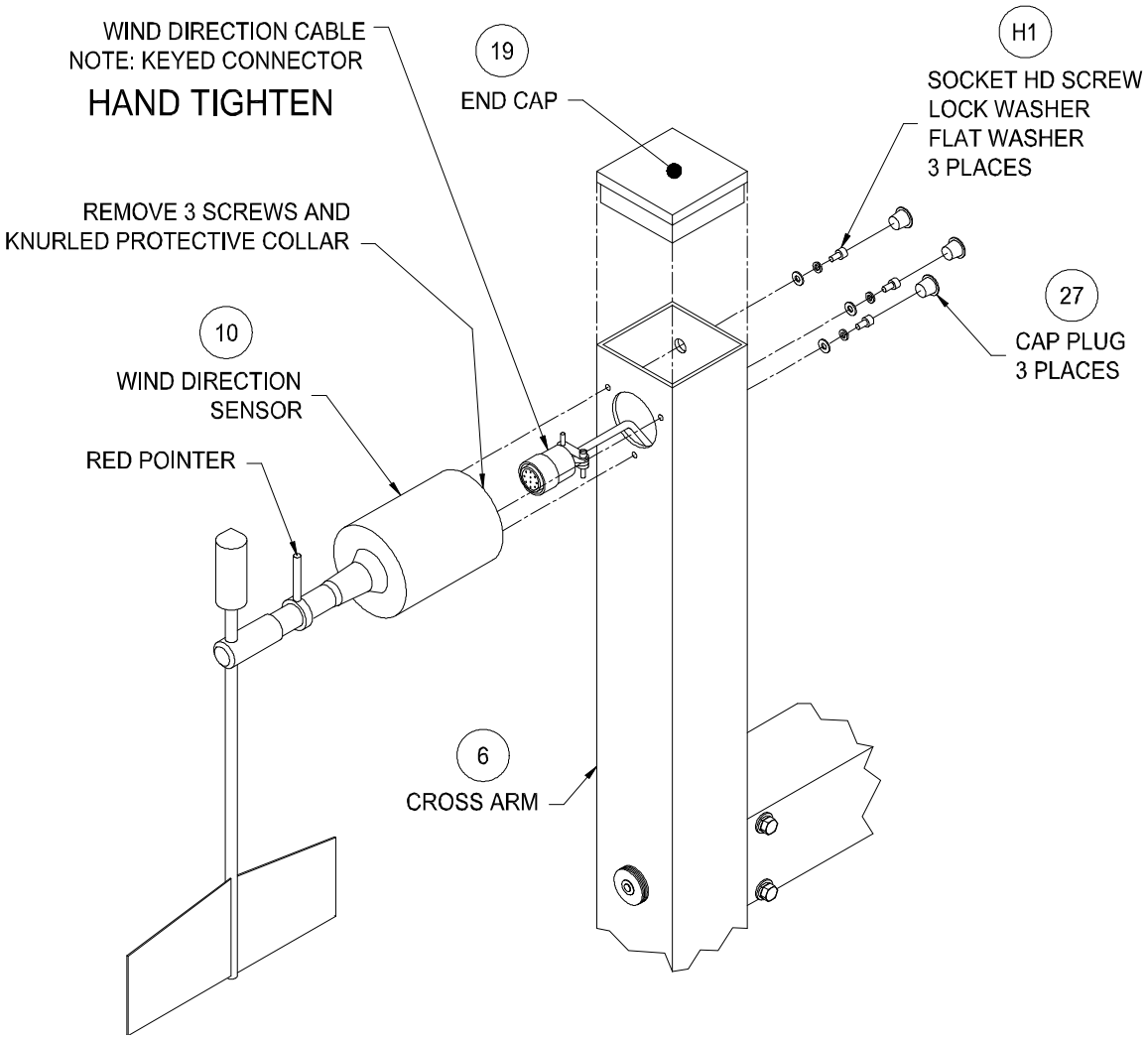
1. **Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Wind direction sensor (Item 10)
2. Three (3) M4 x 8, Socket head screws (Item H1, P/N 80022)
3. 3 mm Allen wrench
4. End Cap (Item 19, P/N ZX1324U2)
5. Three (3) hole plugs (Item 27, PN ZX4491K42)

INSTALLATION INSTRUCTIONS

1. Locate the wind direction sensor (Item10) that has the wind vane already attached to the shaft. NOTE: The wind direction vane has been aligned at the factory such that it will indicate a direction of 360 when it is aligned with the red pointer mounted on the sensor body. DO NOT REMOVE THE WIND DIRECTION VANE FROM THE SHAFT OR THE POINTER FROM THE BODY!
2. Remove the three (3) screws installed in the bottom of the sensor and discard.
3. Remove the knurled protective collar from the sensor connector flange and discard.
4. Route the wind direction sensor cable through the cutout in the top of the cross arm.
5. Carefully insert the keyed cable connector into the sensor and hand tighten.
6. Insert sensor with the cable attached through the cutout in the top of the cross arm and position it so that the red pointer is parallel to the cross arm as shown in Figure 11. Secure the sensor with three (3) Socket head screws and washers (Item H1, P/N 80022), using the Allen wrench provided.
7. Insert the End Cap (Item 27) into the end of the cross arm and tap into place. Insert the three (3) hole plugs in the bottom of the cross arm to cover the screw access holes.
8. To verify wind direction sensor alignment, follow the procedures in section 7.16.



NOTE: THE WIND DIRECTION VANE HAS BEEN ALIGNED AT THE FACTORY SUCH THAT IT WILL INDICATE A DIRECTION OF 360^0 WHEN IT IS ALIGNED WITH THE RED POINTER MOUNTED ON THE SENSOR BODY

DO NOT REMOVE
WIND DIRECTION VANE FROM THE SHAFT
OR THE RED POINTER FROM THE BODY

Figure 11 – Installing Wind Direction Sensor

7.10 INSTALLING TEMPERATURE/DEW POINT SENSOR

SAFETY PRECAUTIONS

1. **Before starting any installation work, ensure that the power circuit breaker is open.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Temperature/dew point radiation shield (Item 13)
2. Temperature/dew point sensor (Item 14)
3. Phillips head screwdriver
4. Two ¼-20 x ¾ bolts with washers (Item H2, P/N 80023)
5. Socket wrench and ¾" socket

INSTALLATION INSTRUCTIONS

1. Locate the temperature/dew point radiation shield.
2. Align bolt holes in the sensor-mounting bracket with the drilled and tapped holes in the right hand side of the tilt-over tower as shown in Figure 12.
3. Secure the radiation shield to the tilt-over tower using two (2) bolts and washers (Item H2, P/N 80023) provided.
4. Being very careful to observe the keyed connector pin orientation, insert the sensor into the connector located on the end of the temperature/dew point cable. (See Figure 12)
5. Loosen the three (3) Phillips head screws on the bottom of the sensor's radiation shield and remove the plastic sensor adapter.
6. Loosen the jam nut on top of the plastic sensor adapter a few turns.
7. Insert the sensor and sensor connector assembly through the bottom of the adapter until the connection between the sensor and the connector is under the rubber seal in the top of the plastic adapter. Hand-tighten the jam nut to secure the sensor in the adapter.
8. Slowly insert the plastic adapter, with the sensor and connector installed, through the bottom of the radiation shield until the end of the sensor touches the top of the radiation shield. Retract the adapter approximately ½" and secure it in place by tightening the three (3) Phillips head set screws in the base of the radiation shield. NOTE: The adapter is retracted approximately ½" to insure the sensor is not contacting the top plate of the solar radiation shield.

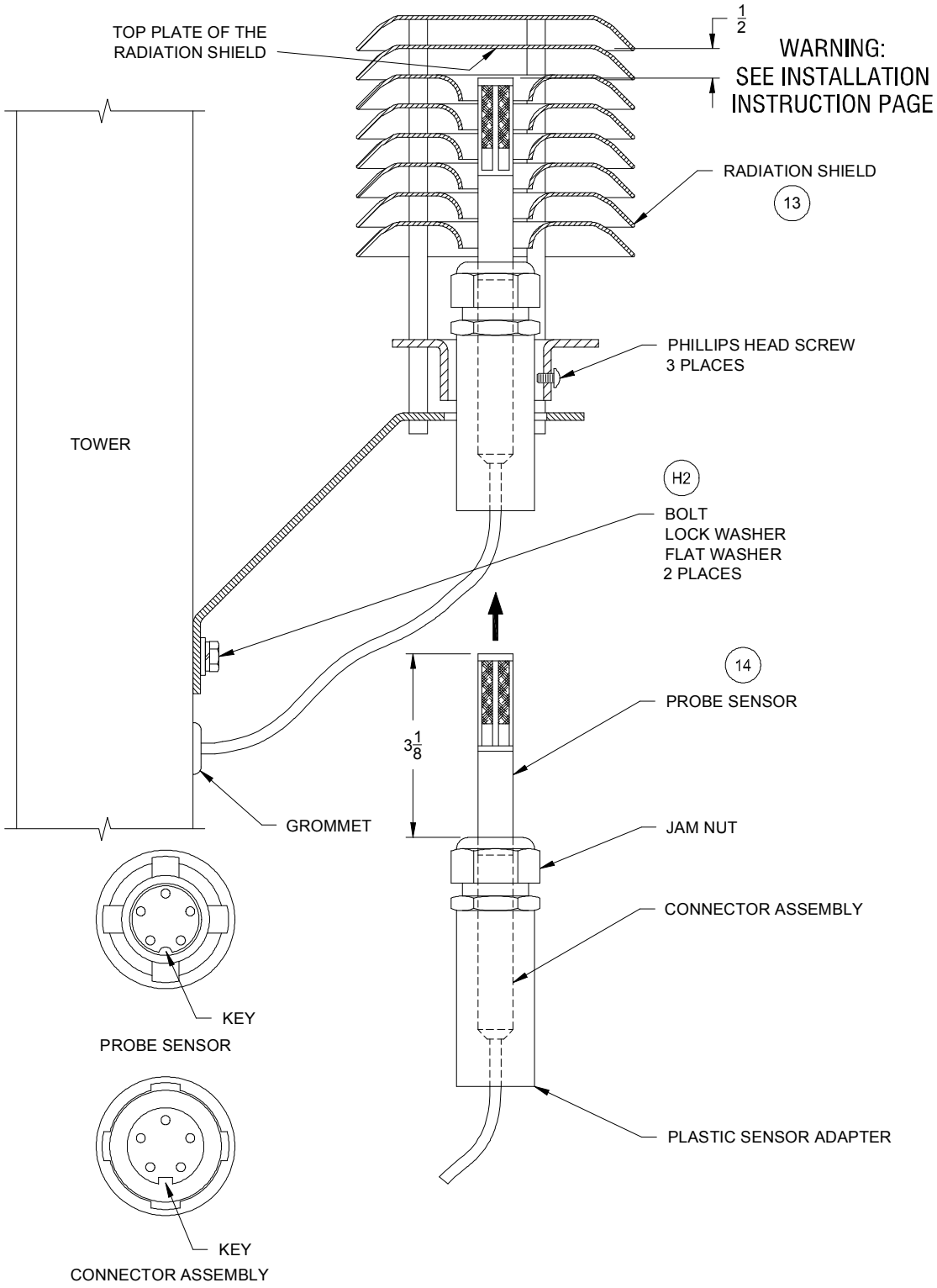


Figure 12
Temperature Dew Point Sensor

***BELFORT** INSTRUMENT Proprietary Information*

7.11 INSTALLING BELFORT MODEL 6000 VISIBILITY SENSOR

SAFETY PRECAUTIONS

1. **Before starting any installation work, ensure that the power circuit breaker is open.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED
See Figure 13

1. Visibility Sensor Assembly, PN 90000-3 (Item 37). (12VDC Version)
2. One 110/240 VAC to 12 VDC 6 amp power supply, P/N SFL612100 (Item 41)
3. Visibility Sensor mounting plate, rubber pads and 4 each 3/8-16 X 5 bolts, nuts, locks and flats, P/N 80097.
4. 8 foot step ladder.
5. Socket wrench with 9/16" socket
6. Cordless drill and 1/8” drill bit
7. 3 each ½” conduit clamps
8. 6 each 1/8 x 5/8 self tapping screws and washers
9. 1 each DB9 Null Modem adapter

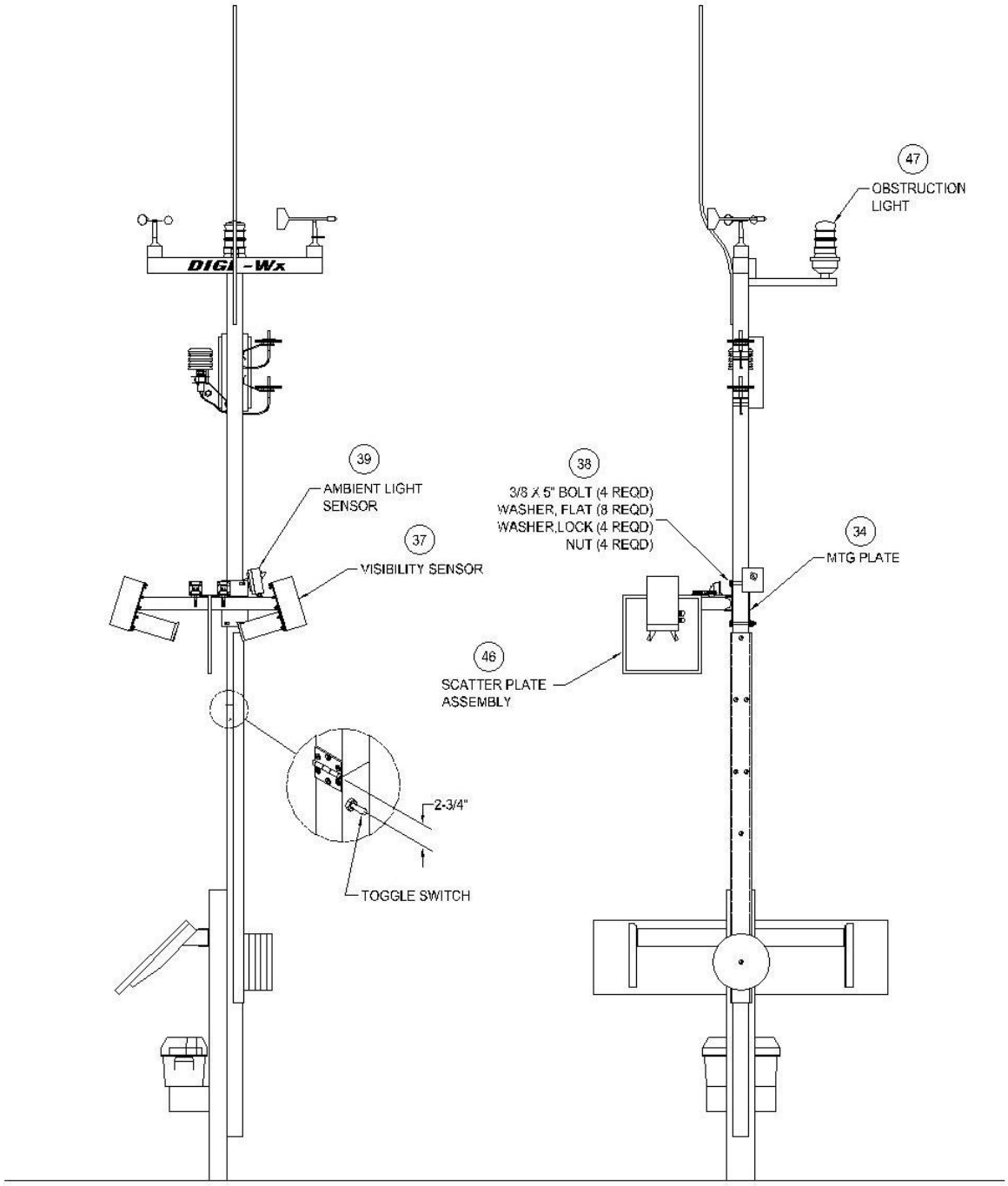


Figure 13
Visibility Sensor with Scatter Plate Installed

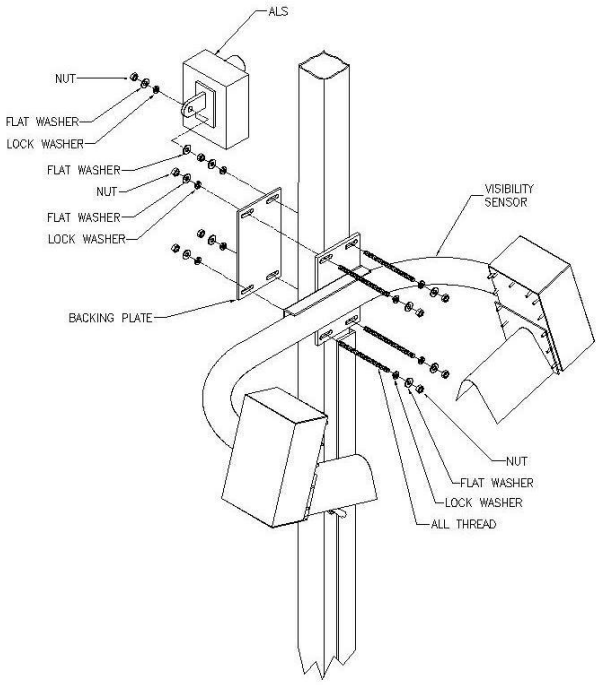
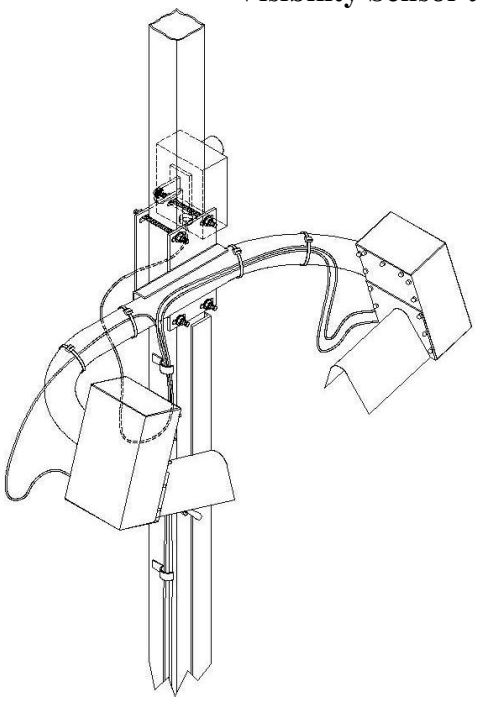


Figure 13a
Visibility Sensor and ALS



INSTALLATION INSTRUCTIONS

Note: The following instructions assume the visibility sensor will be installed on an existing DigiWx tower

1. Unpack the Visibility Sensor and mounting hardware. Check contents against the parts list to assure there are no missing components.
2. Carefully attach the visibility sensor (Item 37) to the upper DigiWx tower section approximately 14 inches above the hinge point just above the channel, using the mounting plate and mounting hardware. Mount the ALS on the top Northern most bolt of the mounting plate on the back side from the VS, pointing in a Northerly direction. Center the bubble on the ALS bubble level to set the proper elevation angle. Wire tie the ALS cable and the VS power and communications cables to the cross arm, forming drip loops at the enclosure entrance points. See Figure 13a
3. Load the three 12 lb. weights on the new channel and secure. Carefully return the tower to the upright position and secure with all three 3/8-16 x 1 bolts and washers.
4. Facing the Visibility Sensor, route the sensor wire bundle down the hinge side of the tower, securing every 24 inches with conduit clamps and self tapping screws using the predrilled holes.
5. At the base of the tower, connect the red and black visibility power harness to the positive and negative outputs of the visibility sensor 12VDC power supply (See Figure 17a).
6. Before the DigiWx AWOS Data Collection Processor (DCP) can sense the 6000, it needs to be configured. Using a laptop running ASOSDCP102 and connected to the DCP through the RS232 communication cable located in the tower, enter the password protected configuration mode of the DigiWx AWOS DCP by applying power to the DCP and typing an “m” to force the DCP to the monitor mode. Enter current date of this configuration change. In configuration mode, set the visibility sensor to “6000” and the baud rate to “9600”. Hit Esc to store the configuration data in the EEPROM. The DCP will ask for the password, enter the password and type “CR”, the new configuration data will be stored. Exit ASOSDCP102 by typing “x” followed by “enter”. Turn power to the DigiWx Tower off.
7. Connect the DB9 connector on the Visibility Sensor Data Cable to the RS232 cable coming down inside the tower using a null modem adapter. Apply Dow Corning DC7 liberally to the connectors to protect against moisture. Place the cable connection in the junction box with the power supply to protect it against weather.
8. Power up the DigiWx tower and visibility sensor. Allow 10 minutes for the averaging algorithm to be satisfied and visibility information will appear in the output string.

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7.12 INSTALLING SOLAR POWER KIT

Note: Each solar power kit and configuration will be sized for the specific location and historical weather conditions. The following is a generic installation guideline.

SAFETY PRECAUTIONS

1. **REMOVE THE IN-LINE FUSE FROM THE RED LEAD OF THE SOLAR PANEL WIRES.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Solar panel support brackets (Part of Item 24)
2. Four ¼" bolts (Part of Item 24)
3. Solar power panel (Item 23)
4. Solar panel mounting channel (Part of Item 24)
5. Four 5/16-4½ lag bolts (Item H9, P/N 80032)
6. Four 3/8-16 x 1 bolts, washers and nuts (Part of Item 22)
7. Socket wrench with 3/8" and 5/16" sockets
8. Flat head or Phillips Screwdriver
9. Extra hardware is supplied if needed (Item H9, P/N 80032)

INSTALLATION INSTRUCTIONS

1. Unpack solar panel.
2. Install solar panel support brackets to the back side of the solar panel as shown in Figure 14 using the four ¼" bolts provided. Be sure that the mounting support brackets are aligned as shown in the instructions located in the Solar Power kit box.
3. Loosely attach the panel support end brackets to the solar panel support brackets as shown in the instructions located in the Solar Power Kit box.
4. Locate the solar panel mounting channel and secure it near the top of the south side of the aluminum channel (P/N 80021) using the four lag bolts (Item H9, P/N 80032) provided.
5. **NOTE: IT IS RECOMMENDED THAT TWO PEOPLE PERFORM THIS STEP.** Attach the assembled solar panel to the solar panel support end brackets using four 3/8-16 x 1 bolts, nuts and washers provided. Start the two top bolts first and finger-tighten them. The two bottom bolts can then be inserted and the solar panel set to 45° from the vertical plane. Tighten all bolts at this time.
6. The red and black power leads will be attached to the solar charge controller as described in section 7.14, Figure 18.

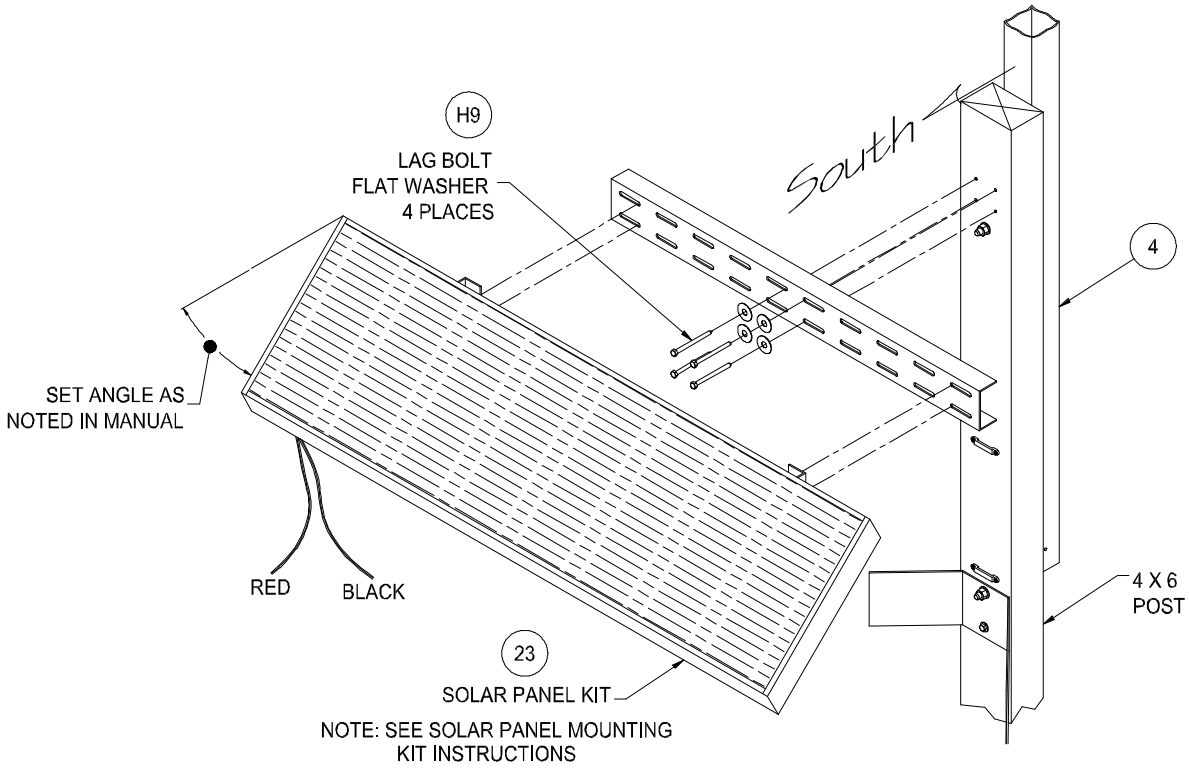

Figure 14 – Installing Solar Power Kit

7.13 INSTALLING BATTERY BOX MOUNTING BRACKET

SAFETY PRECAUTIONS

1. **Before starting any installation work, ensure that the power circuit breaker is open.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Battery box mounting bracket (Item 21)
2. One ¼ x 1¼ lag bolt and washer (Item H8, P/N 80031)
3. Two (2) battery box strap brackets (Part of Item 22)
4. Four (4) wood screws (Part of Item 22)
5. Phillips Screwdriver
6. Socket wrench and 13/16" socket

INSTALLATION INSTRUCTIONS

1. Locate the battery box mounting bracket and place it over the end of the bottom tower mounting bolt as shown in Figure 15. Install washer & nut and tighten snugly.
2. Drill pilot hole and install the lag bolt (Item H8, P/N 80031) through the remaining hole in the battery-box mounting bracket.
3. Locate the two (2) battery box strap brackets (Part of Item 22) and install them on the aluminum channel (P/N 80021) post as shown in Figure 15 at 1" and 12" above the top of the battery box mounting bracket.

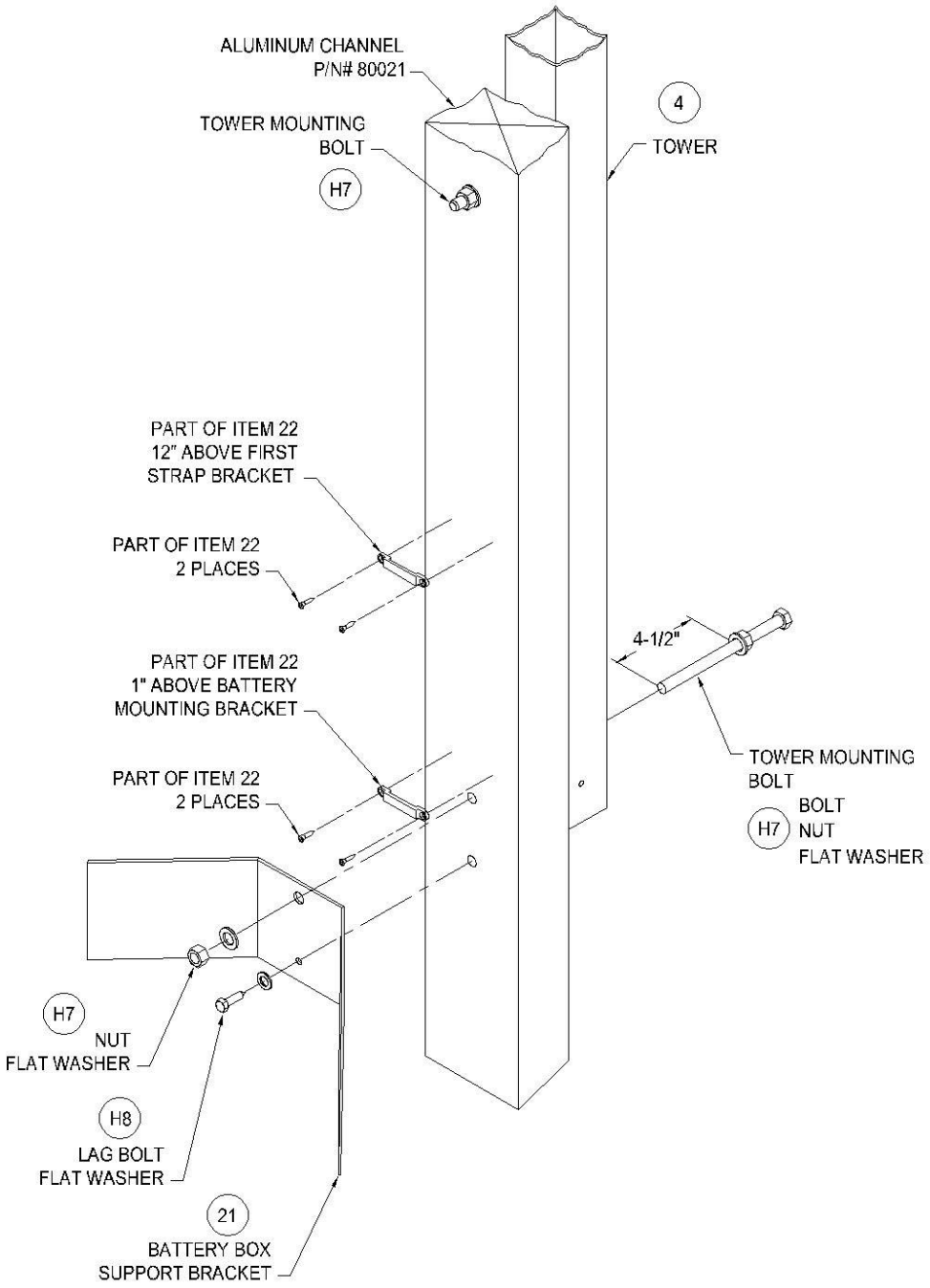

Figure 15 – Installing Battery Box Mounting Bracket

***BELFORT** INSTRUMENT Proprietary Information*

7.14 CONNECTING SOLAR POWER WITH BATTERY BACK-UP

Note: Each solar power kit and configuration will be sized for the specific location and historical weather conditions. The following is a generic installation guideline.

SAFETY PRECAUTIONS

1. **Remove the in line fuse from the red lead in the tower power harness (See Figure 18).**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Slot-head and Phillips screwdriver
2. Deep Discharge 100 amp hour flooded cell group 27 battery procured locally
3. Battery Box (Item 22)
4. Solar Charge Controller (Item 28)
5. Battery Power Cable (Item 31)

INSTALLATION INSTRUCTIONS

1. Unpack the battery and position it near the base of the tilt-over tower.
2. The solar power controller is shipped with a jumper installed. This sets the controller for charging SEALED batteries (any battery that cannot have distilled water added). If a FLOODED battery (any battery that is capable of having distilled water added) is being used, simply remove the jumper to optimize the battery charging circuit for a FLOODED battery.
3. Attach the solar power panel cable to the "Solar" terminals on the solar controller, red to positive and black to negative as shown in Figure 16.
4. Place the solar controller on the battery and connect the 6-inch red lead to the positive (+) terminal and place the 6-inch black lead to the negative (-) terminal. NOTE: Some solar panel charge controllers may include terminal labeled "LOAD". DO NOT USE THESE TERMINALS.
5. Feed the end of the Battery Power Cable without lugs through one of the available water tight penetrations on the AC junction box. The red or positive lead goes to the bottom or input side of the DC circuit breaker. Make sure the breaker is open before attaching any wires. The red wire from the DCP power cable attaches to the top or output side of the DC breaker. The black or negative Battery Power Cable lead is made up with the green wire attached to the grounding stud, and the black lead from the DCP power cable. See Figures 17a and 17b
6. Attach the lugged ends of the Battery Power Cable to the battery terminals, red to positive and black to negative. Reset the DC breaker to enable battery backup.
7. Route the battery-retaining strap through both of the battery retaining strap brackets which are mounted on the aluminum channel (P/N 80021) post and then place the battery in the battery box sitting on the bracket and secure with retaining strap.

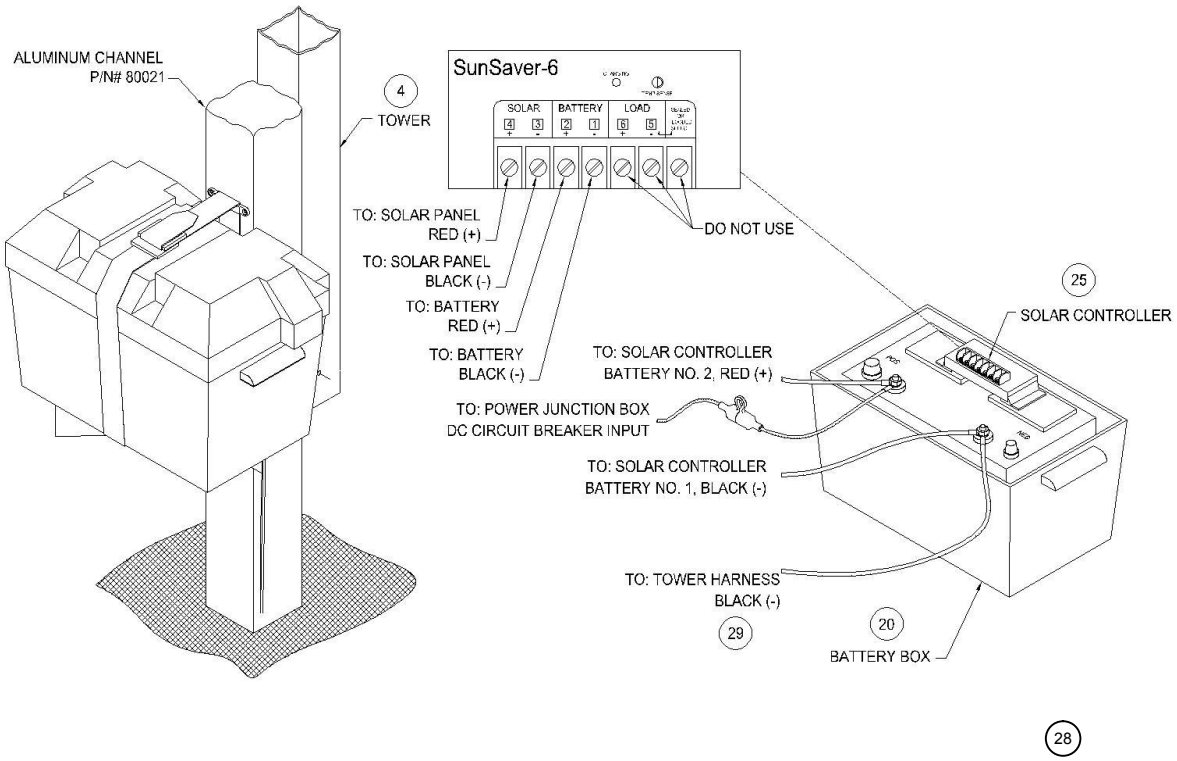

Figure 16 – Connecting Solar Power

7.15 INSTALLING A/C POWER WITH BATTERY BACKUP

SAFETY PRECAUTIONS

1. **Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.**

PARTS AND TOOLS REQUIRED

1. Phillips head screwdriver
2. Slot head screwdriver
3. Green ground wire - 36" (Item 32)
4. Battery box (Item 22)
5. Back-up battery
6. Battery mounting straps (Item 21)
7. Battery Power Cable (Item 31)

INSTALLATION INSTRUCTIONS

1. Locate the AC junction box and ensure that the power circuit breaker to this box is in the OPEN position.
2. Locate the AC power input line. The Black or hot lead goes to the bottom or input side of the AC circuit breaker. The Green or ground wire gets a ¼ inch lug attached and goes to the ground marshalling post. The white or neutral lead makes up with the white lead from the surge suppressor, and the white leads from the Sola AC to DC power supplies.
3. Connect the white wire from the DCP power cable to the negative (-) terminal of the 15VDC power supply output and the green wire to the positive (+) terminal.
4. Feed the end of the Battery Power Cable without lugs through one of the available water tight penetrations on the AC junction box. The red or positive lead goes to the bottom or input side of the DC circuit breaker. Make sure the breaker is open before attaching any wires. The red wire from the DCP power cable attaches to the top or output side of the DC breaker. The black or negative Battery Power Cable lead is made up with the green wire attached to the grounding stud, and the black lead from the DCP power cable. See Figures 17a and 17b
5. Attach the lugged ends of the Battery Power Cable to the battery terminals, red to positive and black to negative. Reset the DC breaker to enable battery backup.
6. Thread the battery-box retaining strap through both of the battery box retaining brackets mounted on the aluminum channel (P/N 80021) post.
7. Place the battery in the battery box, set the battery box on the battery-box mounting bracket, and secure it with the battery-box retaining strap.
8. Attach the tilt-over tower ground wire and the Power Junction Box ground wires to the tower using the tapped hole in the lower section of the tower and the screw provided.
9. Attach the tower ground wire to the earth ground system previously installed using a properly sized copper clamp.

10. Dress the wiring harness high up on the installation by securing the exposed wiring to the tower with wire ties. NOTE: Be sure to secure the wires high enough to prevent them from being damaged by lawn mowers or weed eaters. Keep all bend radii greater than 8 inches.

11. Inspect all connections and insure that they are installed correctly and securely. AC wiring should be inspected to the following wiring schematic diagram:

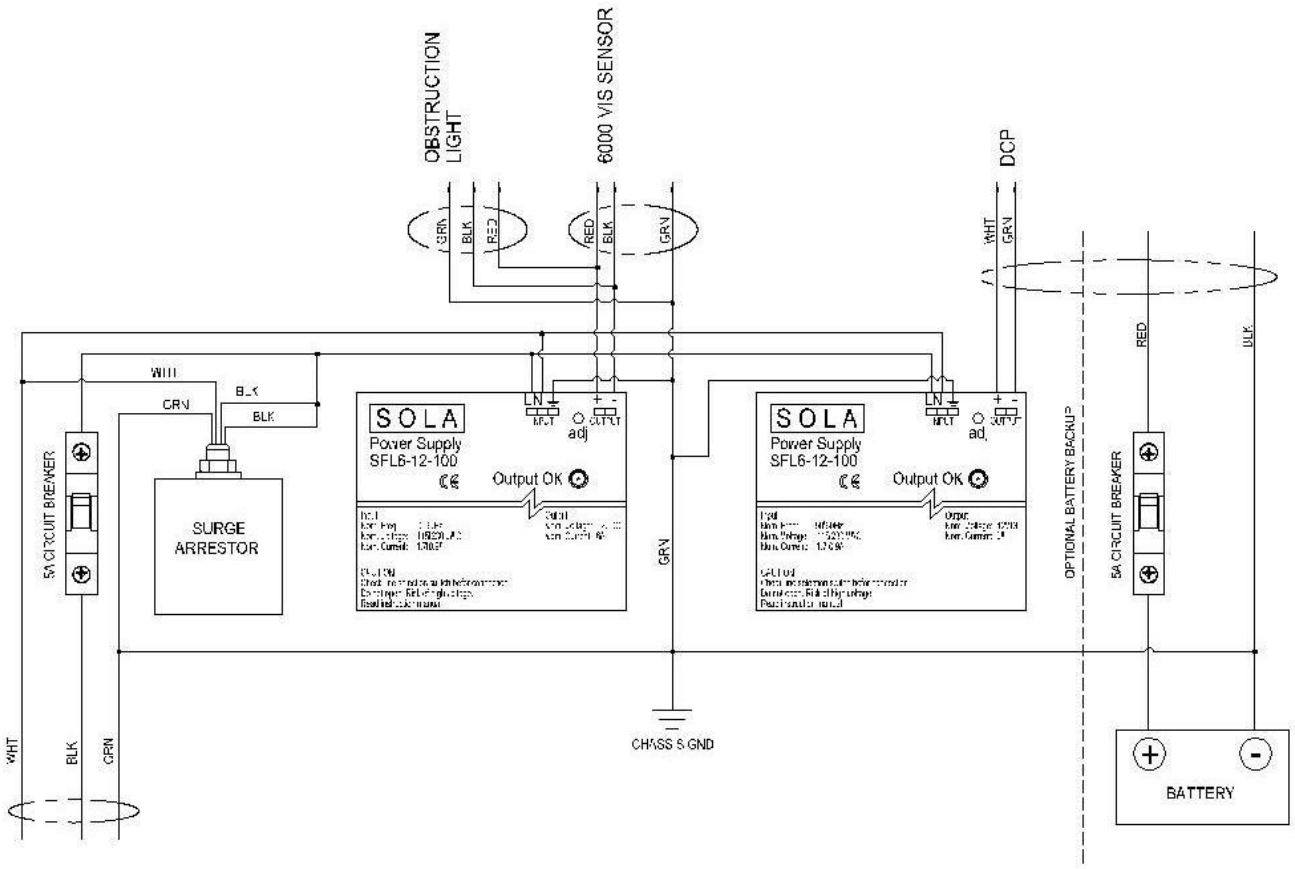

Figure 17a
Basic AC Wiring Schematic

***BELFORT** INSTRUMENT Proprietary Information*

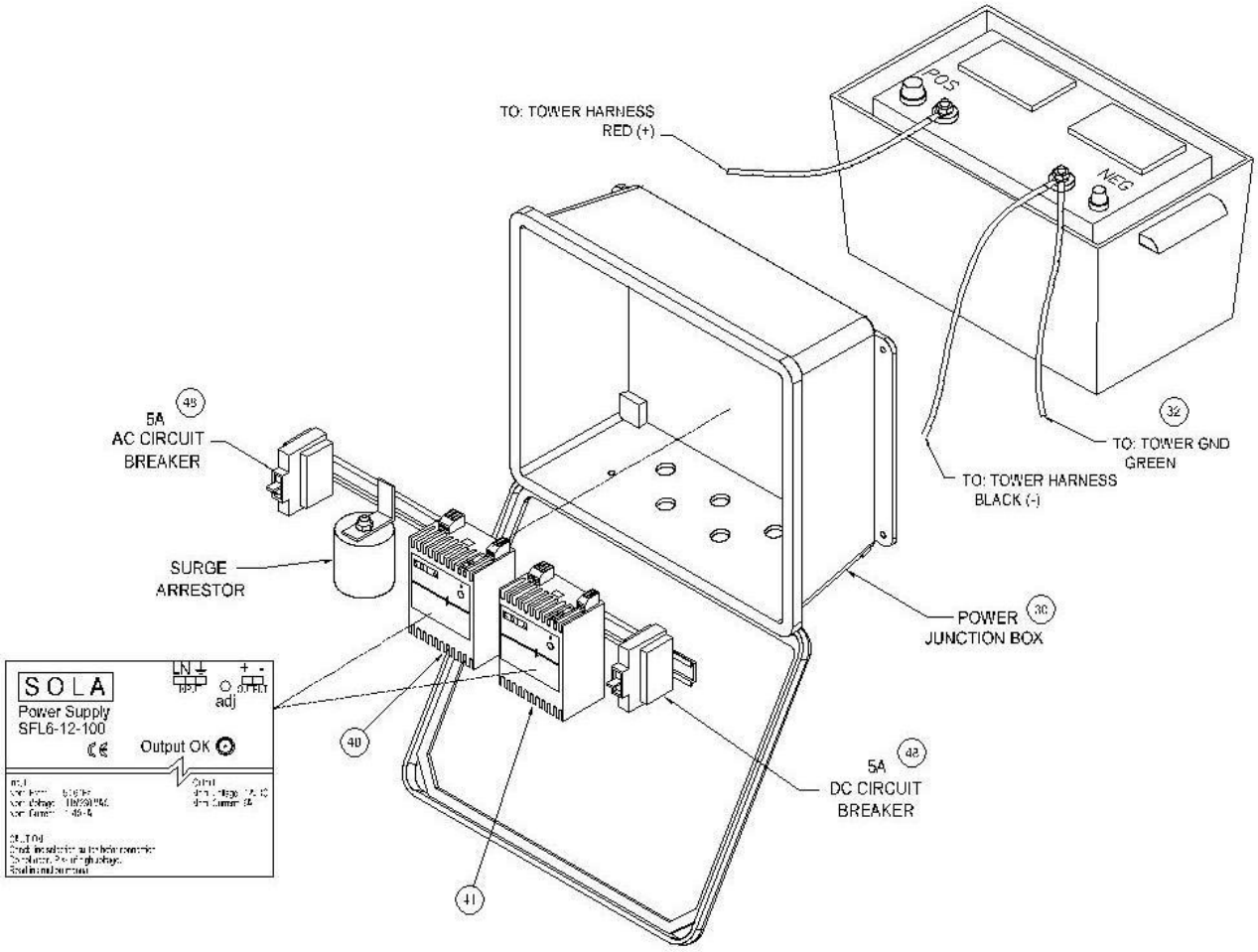

Figure 17b
Installing Commercial AC Power
With Battery Back-up

12. After wiring inspections are complete, replace the cover on the junction box and close the power breaker to this box.

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8.0 DATA ACQUISITION AND TERMINAL UNIT INSTALLATION

SAFETY PRECAUTIONS

1. **Before starting any installation work, ensure that the power circuit breaker is open.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Insure that the desktop computer is installed in a well-ventilated area.**

PARTS AND TOOLS REQUIRED

1. Desktop computer and Monitor(Factory configured with software installed)(Item 5)
2. Digital Data Receiver (DDR) and power supply (Item 43)
3. 9 pin male/female 6' serial cable (Item 44)
4. DigiWx Handheld Receiver (HHDU) (Item 2)
5. Customer-supplied T1/DSL/local telephone line (for internet uploads option)
6. Phillips head screwdriver, small flat head screwdriver

INSTALLATION INSTRUCTIONS

NOTE: PC will be factory configured for each specific airport

1. Unpack and setup the factory configured DigiWx Advisor desktop computer and monitor.
2. Unpack and setup DDR with 3" rubber antenna installed.
3. Connect DDR to desktop computer COM1 port using 6' serial cable.
4. Place DDR at least three (3) feet from the PC to maximize DDR sensitivity.
5. Power-up both the PC and DDR.
6. Power-up HHDU and insure that current weather data is being received from the DigiWx tower.
7. Open HyperTerminal session (Start>All Programs>Accessories>Communications>Hyper Terminal>RS-232) to insure weather data is streaming from DDR.
8. Close HyperTerminal session and then double-click the desktop DigiWx FBO icon…current weather data should be displayed locally on PC.
9. If the local weather data will be uploaded to the internet: a) plug-in T1/DSL line to NIC card, or b) plug-in dedicated local phone line to modem telephone jack labeled Line. Once the PC is connected to the internet, real-time weather data will be automatically uploaded to a Belfort maintained URL if this option was also purchased. Otherwise, the end-user will need to set-up and maintain their own URL.

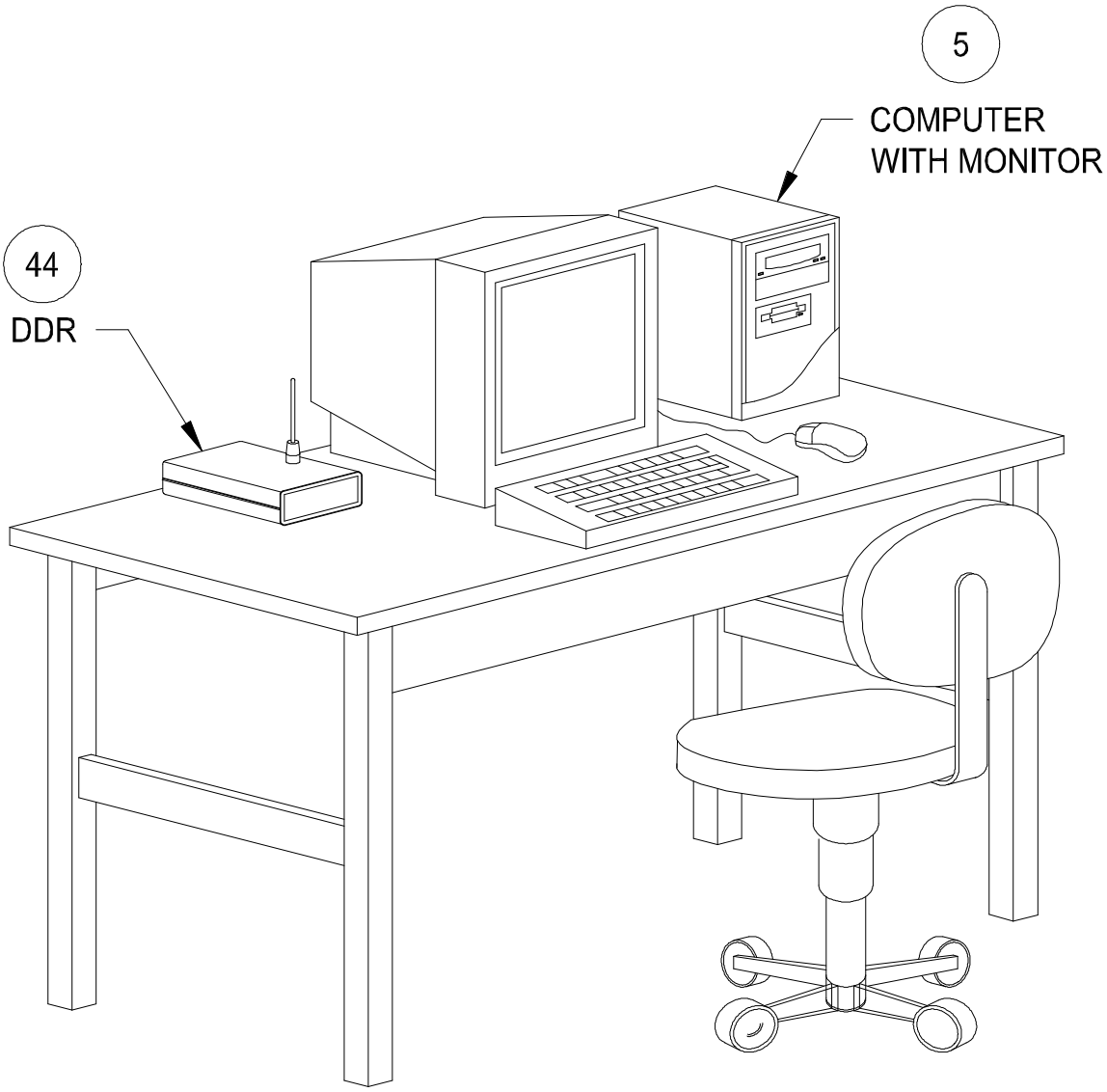

Figure 18
Typical DATU Setup

8.1 INSTALLING DIGIWX PHONE

SAFETY PRECAUTIONS

1. **Before starting any installation work, ensure that the power circuit breaker is open.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Insure that the desktop computer is installed in a well-ventilated area.**

PARTS AND TOOLS REQUIRED

1. Parts already specified for DATA ACQUISITION AND TERMINAL UNIT INSTALLATION
2. Customer-supplied local telephone line
3. Phillips head screwdriver, small flat head screwdriver

INSTALLATION INSTRUCTIONS

NOTE: PC will be factory configured for each specific airport

1. Insure that DigiWx Advisor is already up and running on factory configured PC.
2. Plug-in dedicated local phone line to modem telephone jack labeled Line.
3. Using the telephone number supplied by the customer, test the functionality of DigiWx Phone by calling the dial-in weather number.

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8.2 INSTALLING DIGIWX VOICE

SAFETY PRECAUTIONS

1. **Before starting any installation work, ensure that the power circuit breaker is open.**
2. **Do not perform DigiWx™ AWOS installation tasks during a thunderstorm.**
3. **Insure that the RIF and VHF base station are installed in a well-ventilated area.**

PARTS AND TOOLS REQUIRED

1. Parts already specified for DATA ACQUISITION AND TERMINAL UNIT INSTALLATION.
2. Radio Interface module (RIF) and power supply (Item 45)
3. Microphone Click Interface module (MCIF) (Item 51)
4. Two 9 pin male – female 6' serial cables.
5. Two 6' shielded audio cables (¼" stereo plug to 1/8" stereo mini-plug)
6. Belfort-recommended VHF base station (in excellent working condition)

7. Phillips head screwdriver, small flat head screwdriver

INSTALLATION INSTRUCTIONS

NOTE: DigiWx Voice requires the pre-purchase of DigiWx Advisor

1. Insure that DigiWx Advisor is already up and running on factory configured PC.
2. Unpack and setup Radio Interface (RIF) module, Microphone Click Interface module (MCIF), and VHF base station.
3. Locate 6' shielded audio cable (¼" stereo plug to 1/8" stereo mini-plug) and connect the ¼" stereo plug to Line In on the back of the RIF (PC side). Connect the remaining 1/8" stereo mini-plug to Line In (colored blue) on the back of the PC.
4. Locate 6' shielded audio cable (¼" stereo plug to 1/8" stereo mini-plug) and connect the ¼" stereo plug to Line Out on the back of the RIF (PC side). Connect the remaining 1/8" stereo mini-plug to Line Out (colored green) on the back of the PC.
5. Locate 9 pin male female 6' serial cable and connect the 9 pin male to the 9 pin female located on the side of the VHF base station. Connect 9 pin female end of cable to 9 pin male located on the end of the MCIF.
6. Locate 9 pin male female 6' serial cable and connect the 9 pin male to the 9 pin female located on the end of the MCIF. Connect the 9 pin female other end to the 9 pin male on the end of the USB to Serial Adapter.
7. Plug USB Serial Adapter into USB port on PC.
8. Power up RIF and VHF base station.
9. Ensure DDR is powered-up, then double-click the desktop DigiWx Voice icon.
10. Data is Current should now be displayed locally on PC.
11. Click Show Data box to view current DDR data stream.
12. Insure the accuracy of the sound card adjustments by opening Start>Control Panel>Sound & Audio Devices>Sound Scheme>No Sounds

13. Open Start>Control Panel>Sound and Audio Devices>Audio>Sound Playback>Volume and insure that:
    a. Volume Control & Wave: must NOT be muted
    b. Volume Control: set to ~50% full scale
    c. Wave: set to ~50% full scale
    d. SW Synth: mute box checked
    e. Line In: mute box checked
    f. CD Audio: mute box checked
    g. PC Beep: mute box checked

14. Local pilot(s) activate DigiWx Voice weather broadcast by clicking the microphone the pre-set number of times using the local airport UNICOM frequency.

15. After being recognized by the PC's software, a weather message including wind direction/speed/gusts and local barometric pressure setting is broadcast over an existing UNICOM frequency.

If beginning of DigiWx Automated Advisory is being cutoff…. increase volume control setting noted in number 13b above!

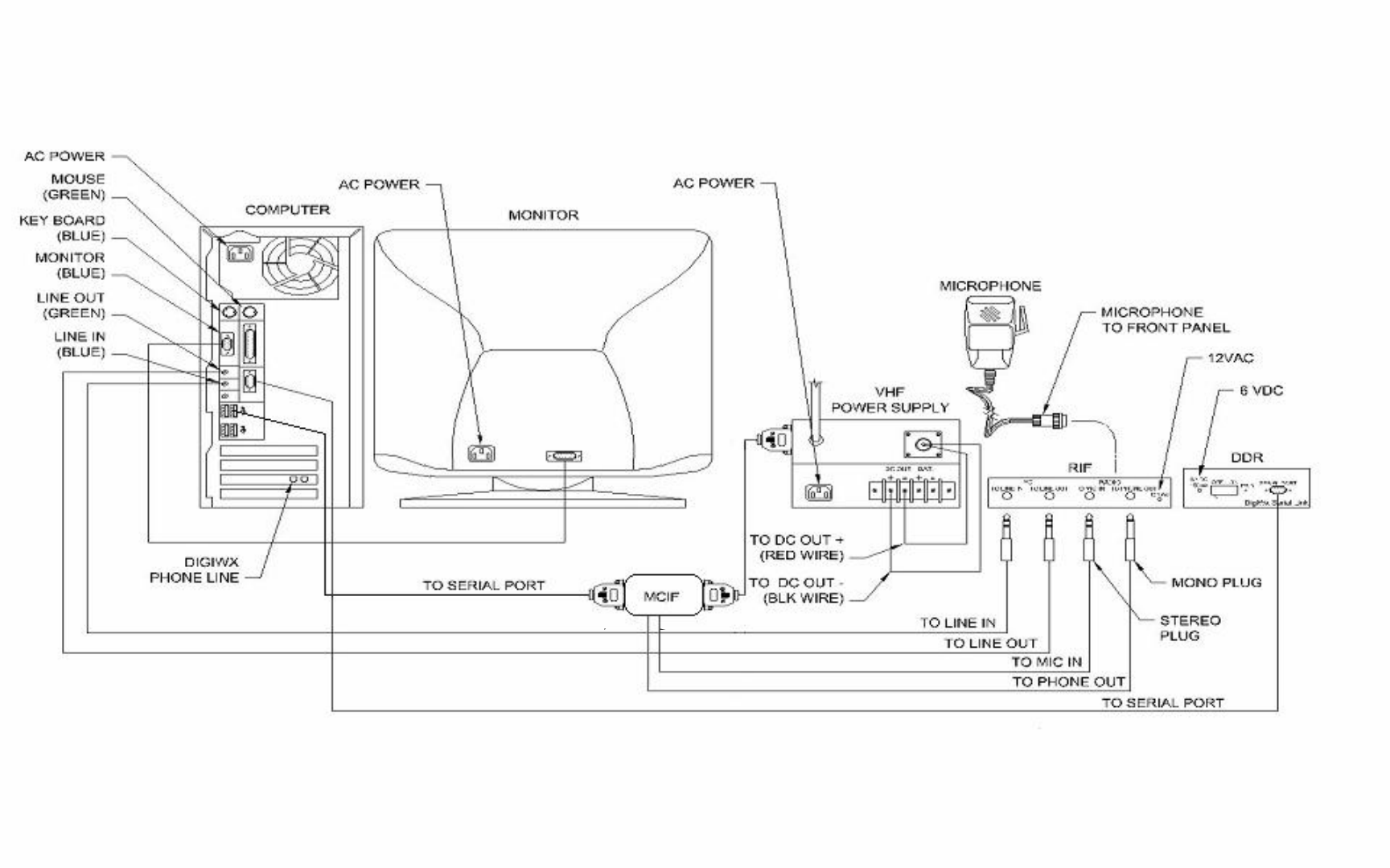

Figure 19 – Installing DigiWx Voice Modules

9.0 SYSTEM CHECKOUT AND VERIFICATIONS – After hardware installations have been completed, the following installation checkout verifications must be completed to verify the system is working properly and reporting data accurately.

9.1 TOOLS AND TEST EQUIPMENT REQUIRED FOR SYSTEM CHECKOUT:

1. Common hand tools (i.e., wrenches, screwdrivers, nut drivers)
2. Digital multi-meter (DMM) Fluke 77 or equivalent (calibrated and traceable to NIST)
3. Notebook computer with DB9 serial interface
4. PROCOMM software PROCOMM Plus, Datastorm Tech or equivalent
5. Portable pressure standard Model 760-16B, (Paroscientific, Inc) (calibrated and traceable to NIST)
6. Visibility sensor calibration kit 32041, (Belfort Instrument Company)
7. Magnetic compass S&Y 183, Stocker and Yale or equivalent
8. Kestrel Model 3000 Wind Instrument with calibration kit
9. Scanner w/AC Adapter Radio Shack PRO 36/273-1455 or equivalent
10. Wire brush (Commercial)
11. Scraper, w/razor blade (Commercial)
12. Gloves, rubber (Commercial)
13. Techni-Tool TECH DUSTER inert dusting gas or equivalent
14. Battery Terminal cleaning brush (Sears P/N 00947697000 or equivalent)
15. Wooden tongue depressors (to be used to remove debris from DCP pressure ports)

9.2 DISPLAY ACQUISITION TERMINAL UNIT (DATU) CHECKOUT

1. To check that System DATU is functioning properly the following actions must first have been completed:
   a. Tower must be operational
   b. DATU must have all software installed and be operational
2. Start the DigiWx Advisor software by double clicking on the DigiWxFBO icon on the desktop. Verify that the screen display appears as similar to figure 20.

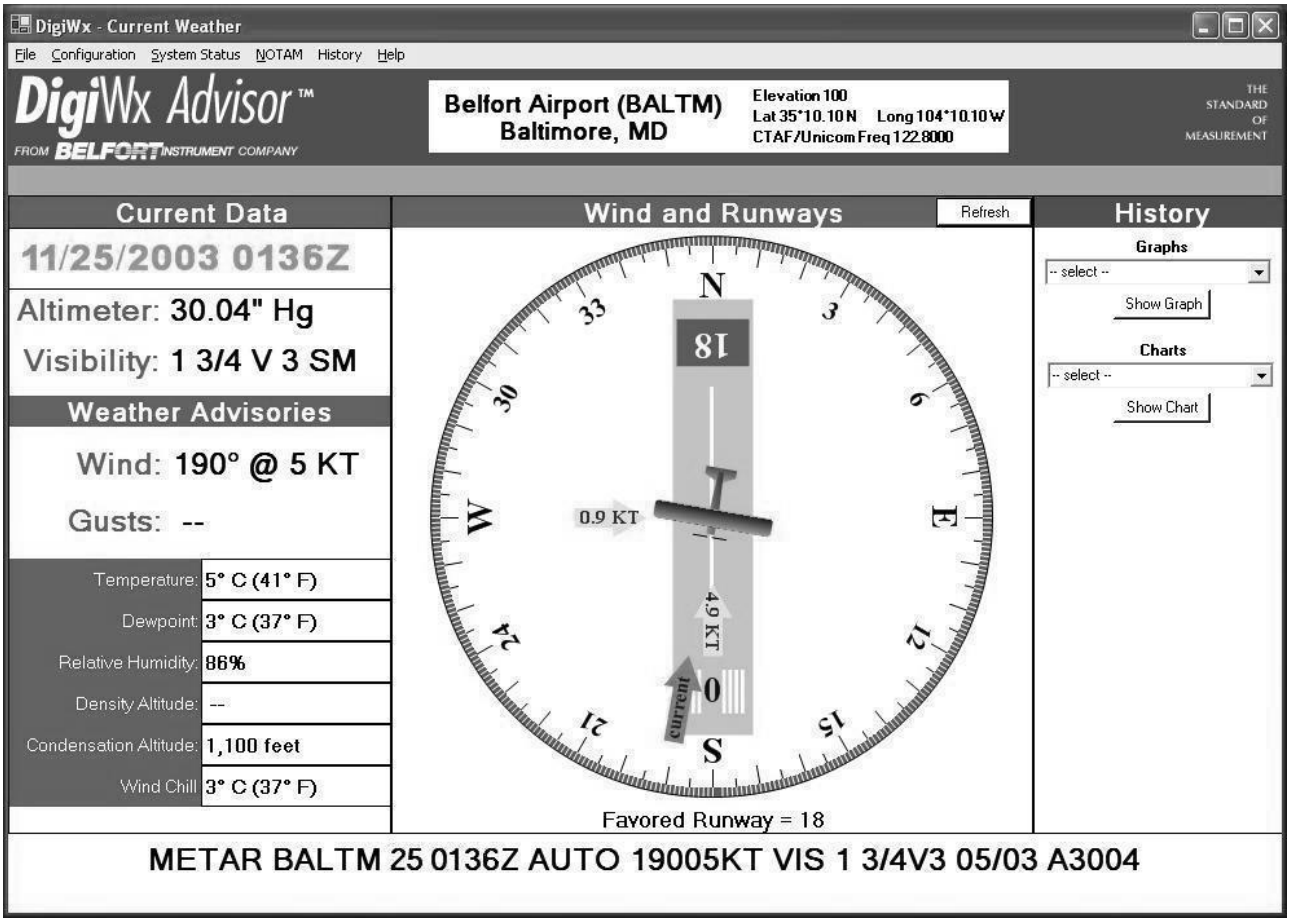

Figure 20
Typical DigiWx Advisor Main Screen

3. Verify that the correct airport name, ICAO, latitude and longitude, site elevation and CATF frequency are displayed. If any of this information is incorrect, contact Belfort Instrument Co. for assistance in correcting these factory installed settings.
4. Verify that all automated weather data outputs are displayed in the "Current Data" section along the left side of the screen display.
5. On the top line menu, select and double click "System Status." Verify that the System status page (figure 21) is displayed.

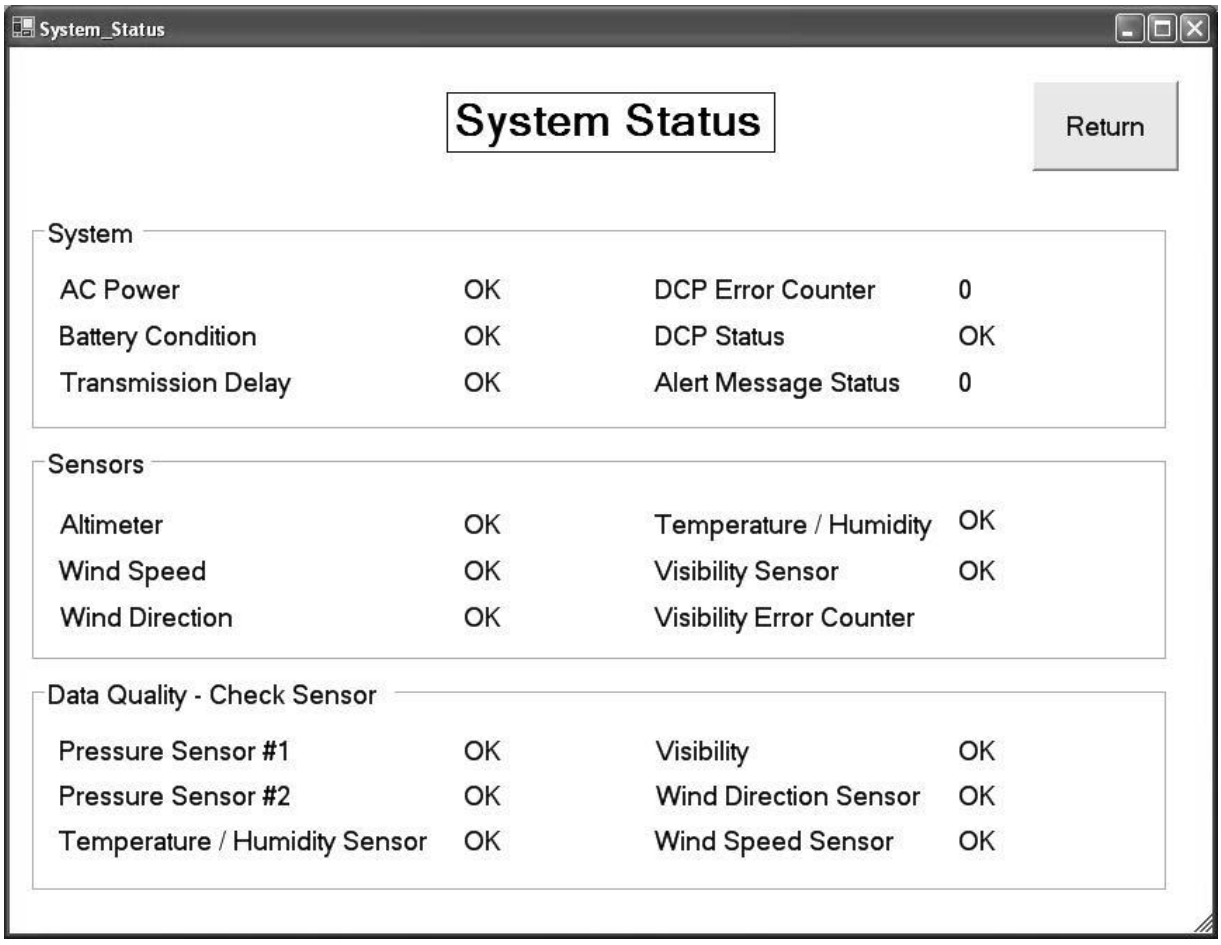

Figure 21
System Status Page

6. Click on the "Return" button to return to the main DigiWx Advisor display screen.
7. At the tower main AC power junction box, simulate a power failure by turning off the circuit breaker.
8. Verify that the System Status Alert Indicator is flashing on the main DigiWx Advisor screen. This verifies that the DigiWx Advisor has recognized the status change.
9. Select the "System Status" page again from the top line menu. An AC Power error flag should be indicated. If no error flag has been set, contact Belfort Instrument Co. for assistance in troubleshooting this problem.
10. Return to the Main Advisor display screen.
11. Select "NOTAM" from the top line menu bar and enter a short duration NOTAM advising users that maintenance activities are being performed following the instructions for entering NOTAMs described in section 4.2.2.6 of the "*DigiWx Operator Manual.*" Verify that the test NOTAM expires at the date and time it was scheduled to expire.
12. Select "History" from the display screen top line Menu.
13. Verify that History data charts can be obtained in accordance with the instructions provided in the "*DigiWx Operator Manual.*" section 4.2.2.1.

9.3 DCP –BAROMETRIC PRESSURE INSTALLATION VERIFICATION & CALIBRATION

SAFETY PRECAUTIONS

1. Do not perform DigiWx® AWOS maintenance tasks during a thunderstorm.
2. Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.

PARTS AND TOOLS REQUIRED

1. Paro-scientific model 760-16 portable pressure standard with current NIST traceable certification.
2. Notebook computer running ASOSDCP102 and RS232 cable
3. DigiWx® AWOS hand held display
4. Socket wrench and 13/16" socket
5. Eight (8) foot step ladder

INSTRUCTIONS

1. At the DATU display terminal, issue a NOTAM advisory, to alert users that the DigiWx system is being serviced, prior to beginning this maintenance tasks. The NOTAM to be issued is **"DigiWx system being serviced, do not use current weather data outputs."** Verify that this NOTAM advisory is displayed on the operator screen prior to beginning this maintenance tasks. Instructions for issuing and deleting NOTAMs are provided in the *"DigiWx Operator Manual"* sections 4.2.2.5 and 4.2.2.6**.**
2. At the tower, toggle the "ALERT MESSAGE" toggle switch located on the lower half of the hinged tower section (refer to figure 2.a) six (6) times (See Table 3).

DigiWx® Alert Messages
1. Contact FBO for an important message.
2. Wind speed sensor INOP.
3. Wind direction sensor INOP.
4. Temperature and/or humidity sensor INOP.
5. Barometric pressure sensor INOP.
6. DigiWx® AWOS being serviced. Do not use readings.
7. DigiWx® AWOS not maintained. Do not use readings.
8. Private DigiWx® AWOS weather station. Do not use.
9. Landing area warning
0. No Alerts

Table 3

3. Remove tower-securing bolts and lower the tower until the DCP is at a comfortable working height so that the portable pressure standard on an upper step of the ladder is at the same height as the DCP. Secure the tower in that position by tying the rope to the base of the DigiWx® tower. Figure 20 illustrates the height locations where the various DigiWx sensors and other system components are located on the tower. Figure 22 illustrates the tower as typically secured for maintenance.

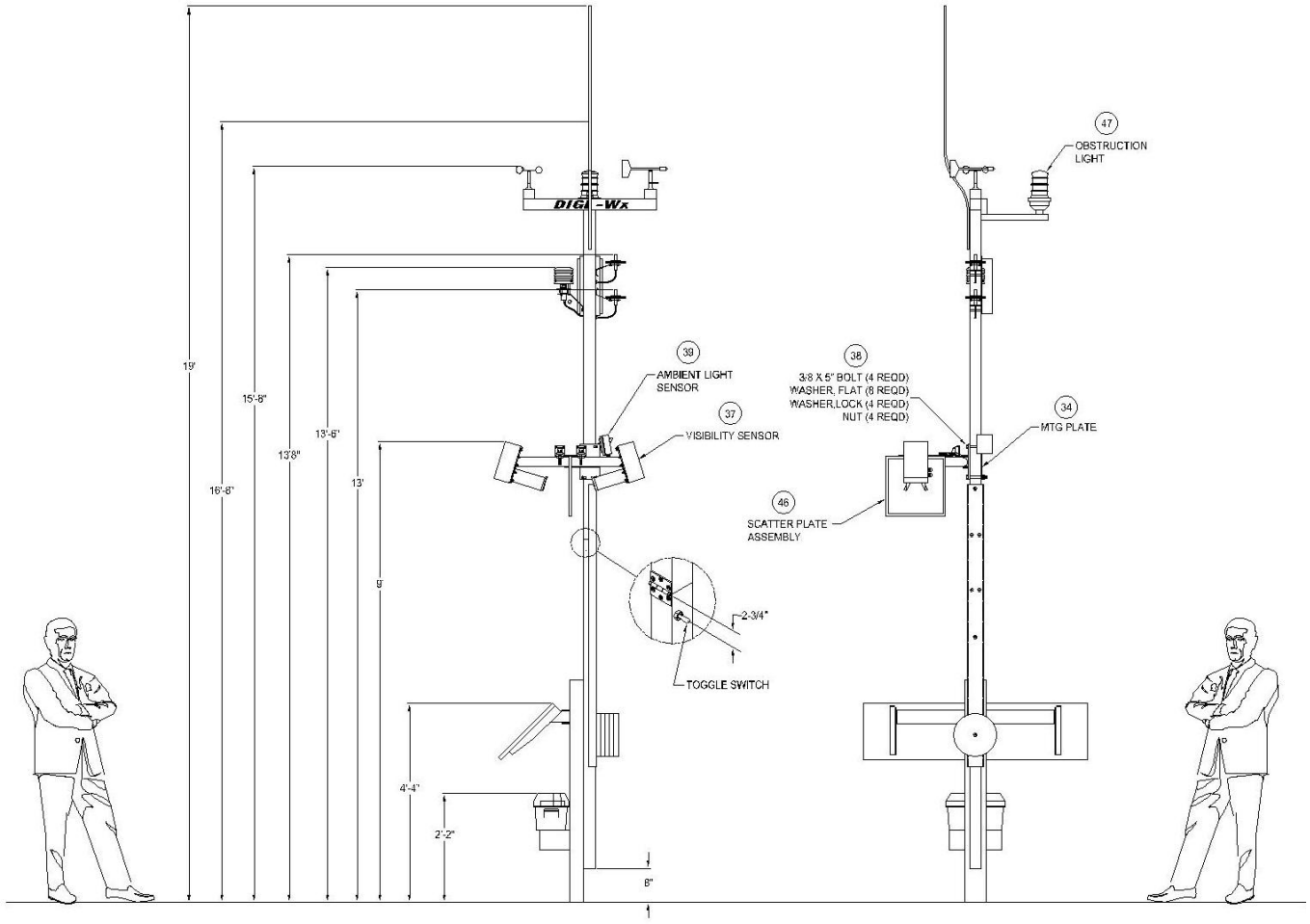

Figure 22
Typical DigiWx Tower Equipment Mounting Locations

***BELFORT** INSTRUMENT Proprietary Information*

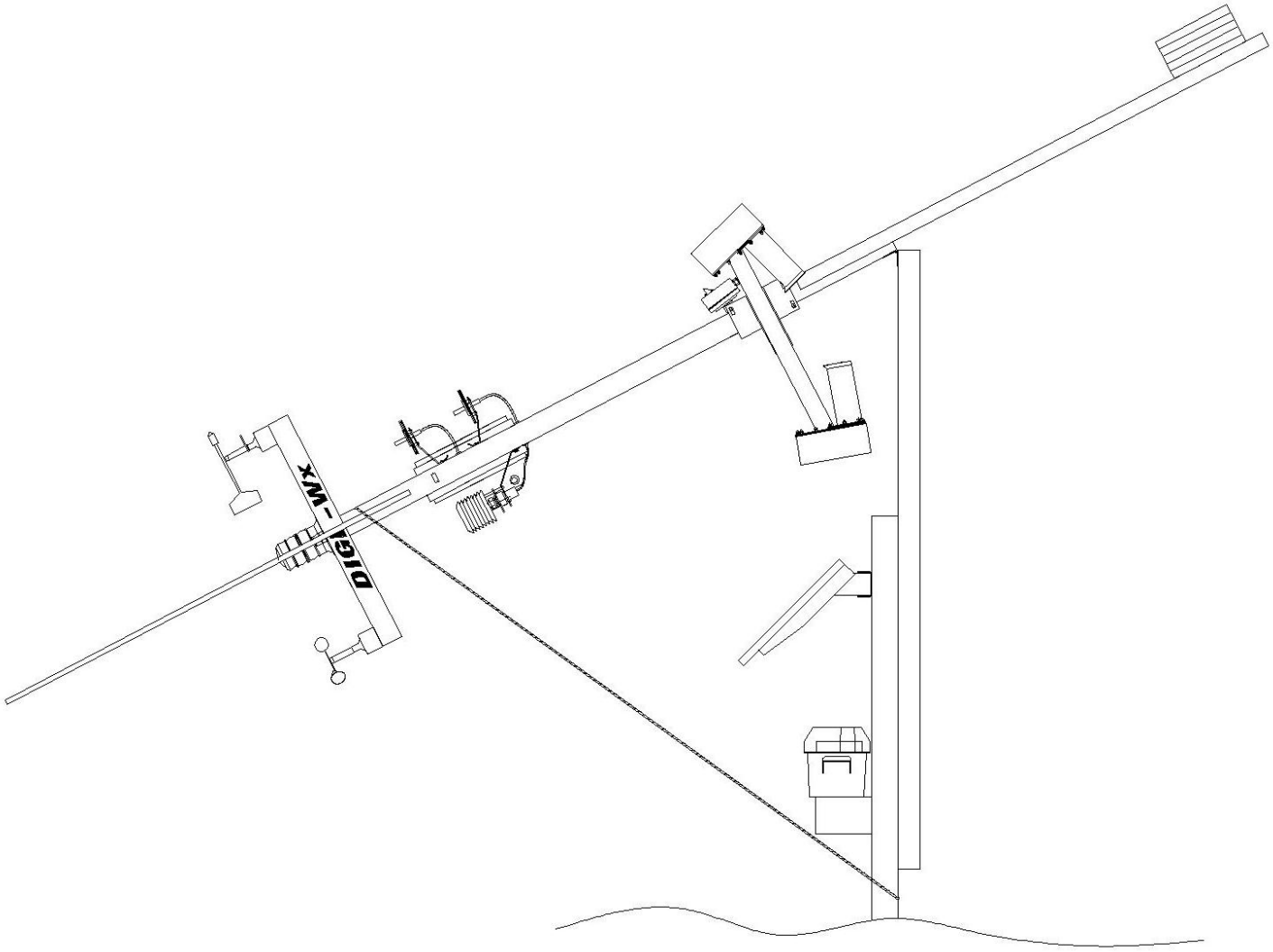

Figure 23 - Securing the Tower for Maintenance

4. Power on the DigiWx® AWOS hand held display. The word "ALERT" must be displayed across the HHDU runway display. Push the "PAGE" button and the message "DigiWx® AWOS being serviced" must appear.
5. The Alert messages are programmed in the same order as they appear in Table 3. If an alert message other than message 6. is displayed, consult the list of alert messages in Table 3. You will need to toggle the tower switch an appropriate number of times until the "DigiWx® AWOS being serviced" alert message is displayed. For example, if the alert message number 2 is displayed, toggle the switch 4 times.
6. Verify accuracy of pressure sensor data - Place the portable pressure standard on the ladder at the same height (± 6 inches) as the DCP. Turn the standard on and allow it to stabilize for five (5) minutes. Check for low battery indication (a decimal point will appear between each digit of the displayed pressure when the battery is low).
7. If the system has a visibility sensor, there will be a serial RS232 cable from the visibility sensor connected to another RS232 cable which is connected to the back of the DCP. Disconnect these two RS232 cables. Connect the cable connected to the DCP to the test notebook computer RS232 serial communication port. If there is no visibility sensor installed, connect the portable notebook computer (with ASOSDCP102 installed) to the DCP through the serial communication cable that extends to the bottom of the tower.
8. If the system has a battery backup, disconnect the battery power by turning circuit breaker off in the power distribution box. Start the ASOSDCP102 program. After 10 seconds, turn the circuit breaker in the DigiWx® power box off and then on again to force a reset. Immediately type "m" <enter> to put the DCP in monitor mode.
9. Type "T10" <enter> to display the measured pressure from the 2 sensors. If the measured pressure of either of the sensors differs from the standard by more than 0.10 in Hg, it indicates that the sensor is not suitable for calibration. Replace the DCP before continuing further with this procedure. DO NOT ATTEMPT TO CALIBRATE A PRESSURE SENSOR THAT DIFFERS FROM THE STANDARD BY MORE THAN 0.10 in Hg.
10. If either sensor differs from the standard by more than .02 in Hg, or the sensors differ from each other by more than .02 in Hg, start the pressure sensor calibration process by typing "U" and press <enter>. The DCP will prompt you for a password. Enter the site password (the password is case sensitive). Next, hold the CTRL key down and type "V" then enter the 5 digit target pressure from the portable pressure standard (Example 30.235) and press <enter>. The automatic calibration routine will make any required adjustments to the pressure sensor parameters. At the end of the routine, press the "esc" key to return to the main configuration menu.
11. Verify that the pressure sensors are calibrated by repeating step 10. If the sensors still differ from each other or the standard by more than .02 in Hg. repeat step 11.
12. Type "c" and enter the new date of calibration, then type "cr".
13. Press the "Esc" key. This will cause the data to be saved in the EEPROM.
14. Exit ASOSDCP102 by typing "x" then press <enter>.
15. Disconnect the RS232 cable from the notebook computer and reconnect the RS232 data communication cable to the visibility sensor (if present). Apply Dow Corning #4 liberally to the connection to protect against moisture. .
16. Remove and reapply power to the DCP to restore normal operation.

17. If additional installation verification tasks are to be performed, skip to next sensor verification task. If verification tasks are complete, toggle the "ALERT MESSAGE" switch 4 times to return the unit to service.
18. Observe system output and verify that the system is reporting data as expected.
19. Reconnect the positive lead to the backup battery if present.
20. Untie the rope and SLOWLY erect the tower to the vertical position and secure it by installing and tightening (DO NOT OVER TIGHTEN) the three (3) tower-securing bolts. NOTE: Be careful to avoid pinching the wires on the inside of the hinged Tower Section when raising the tower.
21. If all maintenance tasks are complete, issue another NOTAM advising users that "**maintenance activities were completed, system has been returned to normal operation**." The expiration date and time of this NOTAM should coincide with the same expiration date and time of the previous advisory NOTAM that was issued to put the system in the maintenance mode. Verify that this NOTAM advisory is correctly displayed on the operator screen. Refer to the *"DigiWx Operator Manual"* sections 4.2.2.5 and 4.2.2.6 for instructions on how to enter and delete NOTAMs**.**

9.4 TEMPERATURE, HUMIDITY AND DEW POINT INSTALLATION VERIFICATION PROCEDURES

SAFETY PRECAUTIONS

1. Do not perform DigiWx® AWOS maintenance tasks during a thunderstorm.
2. Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross-arm or the sensors. The extra weight may cause the tower to fall over rapidly.

PARTS AND TOOLS REQUIRED

1. Kestrel Model 3000 Wind Instrument
2. DigiWx® AWOS hand held display

The Temperature and Dew point Verification Test is a confidence test, which verifies that the DigiWx® AWOS air temperature and humidity readings compare reasonably with readings taken by a calibrated Kestrel Model 3000 Wind Instrument.

VERIFICATION INSTRUCTIONS

1. Turn on the HHDU. Stand near the base of the DigiWx® tower, facing into the wind. Observe the DigiWx® wind indicator vane to ascertain wind direction. Turn on the Kestrel Model 3000, select average mode, and hold the Kestrel Model 3000 at eye level, square to the wind and record the temperature and relative humidity. If the wind speed is below 2 mph, wave the Kestrel Model 3000 back and forth several times to assure air temperature is being measured and not case temperature. Press refresh on the HHDU to get the most recent DigiWx® data. The temperature and humidity readings should agree within 20%.
2. If either temperature or relative humidity does not agree within 20%, the sensor should be replaced.

9.5 6000 VISIBILITY SENSOR – INSTALLATION VERIFICATION & CALIBRATION INSTRUCTIONS

SAFETY PRECAUTIONS

1. Do not perform DigiWx® AWOS maintenance tasks during a thunderstorm.
2. Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.

PARTS AND TOOLS REQUIRED

1. Belfort Instrument Company 6000 Calibration Kit, Item 46, P/N 90001
2. Notebook computer running Hyper-terminal and male/female serial DB9 cable
3. Window cleaner and soft cloth
4. Tape Measure

PROCEDURE

1. At the DATU display terminal issue a NOTAM advisory to alert users that the DigiWx system is being serviced prior to beginning this maintenance tasks. The NOTAM to be issued is **"DigiWx system being serviced, do not use current weather data outputs."** Verify that this NOTAM advisory is displayed on the operator screen prior to beginning this maintenance tasks. Refer to the "DigiWx Operator Manual" sections 4.2.2.5 and 4.2.2.6 for instructions on how to enter and delete NOTAMs.
2. Before beginning calibration, clean the visibility sensor glass windows, the ALS window, and the scatter plate with a non-abrasive commercial window cleaner and a soft cloth.
3. Toggle the "ALERT MESSAGE" toggle switch located on the lower half of the hinged tower section six (6) times.
4. The Alert messages are programmed in the same order as they appear in Table 3. If an alert message other than message 6. is displayed, consult the list of alert messages in Table 3. You will need to toggle the tower switch an appropriate number of times until the "DigiWx® AWOS being serviced" alert message is displayed. For example, if the alert message number 2 is displayed, toggle the switch 4 times.
5. Mount the scatter plate to the sensor support bracket as shown in Figures 24 and 25. Make sure the scatter plate is spaced an equal distance from the center of each hood, within ±¼ inch (see figure 25).

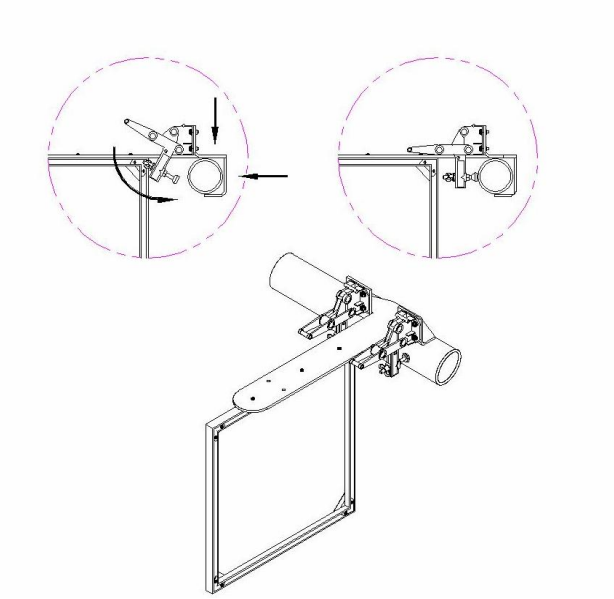

Figure 24
Scatter Plate Attachment Detail

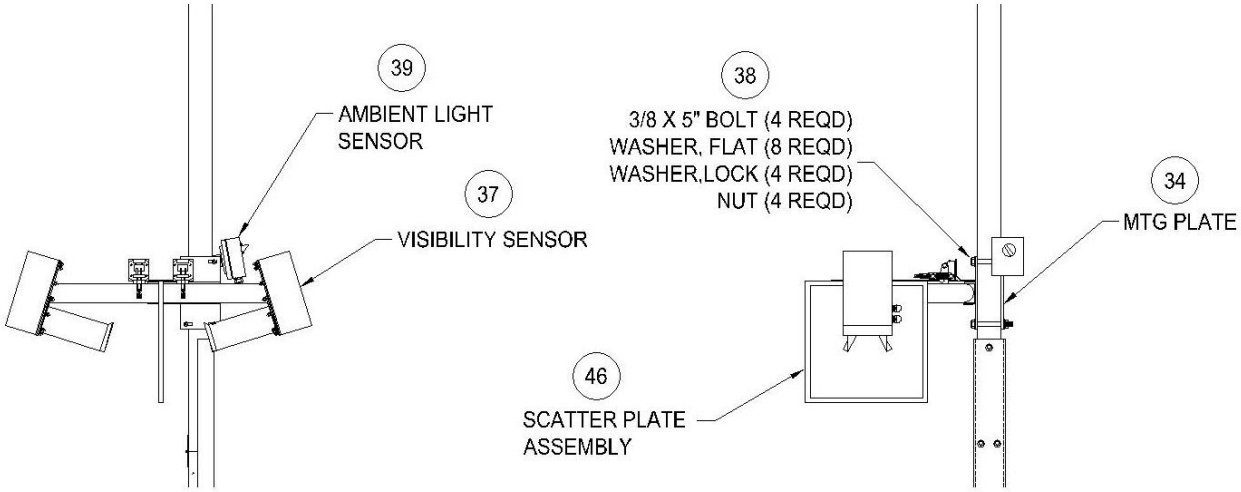

Figure 25
Tower with Visibility Scatter Plate Attached

6. If the battery backup option is installed, disconnect the red positive lead from the battery.
7. At the bottom of the tower, the RS232 communication cable from the visibility sensor is connected to the RS232 cable from the DCP through a null modem adapter. Disconnect the RS232 visibility sensor cable from the null modem adapter and connect it to a notebook computer running Hyper terminal or Procomm, 9600 baud, N,8,1. It may be convenient to add a RS232 extension cable.

8. Remove power to the DCP by turning off the circuit breaker in the power box. After waiting 10 seconds, turn it back on again to force a reset. The display should show the start message with model and version number. If not, disconnect and reconnect the RS232 cable and remove and reapply power to the DCP once again. If this does not result in the display showing the start message with model and version number, contact Belfort Instrument Co. customer support at 1-800-937-2353.
9. Hold down the "ctrl" key and type the letter "V" then type the word "foggy" in lower case letters when prompted for the password.
10. Type "FT" then press <enter> to run diagnostics, if the first 2 characters are FP, sensor is OK, FF indicates a failure and further diagnostics are necessary (see troubleshooting section of this manual). Type "FJ" to start streaming data.
11. Check the state of calibration first. Allow the measured visibility to settle for 5 minutes. If the ExtCo (the number in the last numerical column on the right) is within 5% of the value marked on the scatter plate, no recalibration is required. If recalibration is needed, proceed to the next step.
12. The zero-state calibration must be done first. Place the opaque filters (the triangle shaped pieces of rubber) on the receiver and transmitter hoods as close to the glass windows as possible. The filters are 5/8 thick rubber, triangular in shape, with ears that hook over the transmitter and receiver hoods to secure them in place. They may be attached easily near the mid point of the hood and slid back to the window as shown in Figure 26.

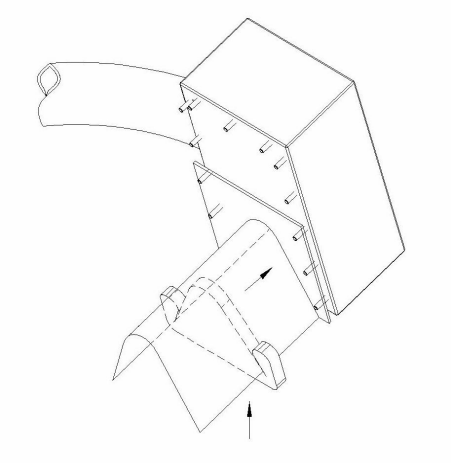

Figure 26
Installation of Opaque Filters on
Transmitter and Receiver Hoods

13. Type "FZ" then press <enter> on the terminal. Answer "Y" when prompted "are you sure" question and wait approximately five (5) minutes for the routine to finish and prompt for acceptance. This acceptance prompt allows you to recover from an accidental invocation of the routine. Acceptable values for the zero offset are between –0.01 and +0.01. If the zero offset value displayed is acceptable, type "Y" and then press <enter>. The new value will be written to EEPROM, it will be discarded if you answer "N". Answer yes and press <enter> when prompted with the "OK to save TxPwrCal?" Question.
14. Remove the opaque filters from the hoods.

15. The span-state calibration requires the use of the scatter plate installed as shown in figure 24
16. Install the scatter plate and record the Cal_ExtCo marked on the scatter plate.
17. Type "FC" and press enter. Make sure the number in the configuration information for Cal_ExtCo is the same extinction coefficient as on the calibration scatter plate. If not, enter the correct number in the configuration data. Press (ESC) key to get back to the terminal screen.
18. Type "FS" and type "Y" at the "are you sure" query. When the routine has finished, the terminal will display the new span calibration value and prompt for acceptance. Acceptable values range between 0.5 and 4.0.
19. Record the acceptable value displayed on the Quarterly maintenance data record form.
20. Type "Y" and the new span value will be written to EEPROM . Remove the scatter plate and store it for protection.
21. Type "FR" to reset the sensor and exit the diagnostic mode.
22. Disconnect the notebook computer and reconnect the sensor RS232 cable to the communication cable running up to the DCP at the bottom of the tower. Apply Dow Corning #4 liberally to the connection to protect against moisture.
23. If the battery backup option is installed, reconnect the red battery cable lead to the positive terminal of the battery.
24. If additional installation checkout verification tasks are to be performed, skip to the next verification task. If verification tasks are complete, toggle the "ALERT MESSAGE" switch 4 times to return the unit to service.
25. Verify the system begins outputting visibility information after a ten (10) minute algorithm delay.
26. If all maintenance tasks are complete, issue another NOTAM advising users that "**DigiWx maintenance activities were completed, system has been returned to normal operation**." The expiration date and time of this NOTAM should coincide with the same expiration date and time of the previous advisory NOTAM that was issued to put the system in the maintenance mode. Verify that this NOTAM advisory is correctly displayed on the operator screen. Refer to the *"DigiWx Operator Manual"* sections 4.2.2.5 and 4.2.2.6 for instructions on how to enter and delete NOTAMs**.**
27. If you need additional assistance or have questions concerning these maintenance or calibration tasks, contact Belfort Instrument Co. customer support at 1-800-937-2353.

9.6 WIND DIRECTION SENSOR - INSTALLATION VERIFICATION

This maintenance includes checking the sensor for free rotation and balance and verification of sensor directional alignment and accuracy.

SAFETY PRECAUTIONS

1. Before starting any power installation/Maintenance tasks, ensure that the A/C power circuit breaker is in the open position.
2. Do not perform DigiWx® AWOS maintenance tasks during a thunderstorm.
3. Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.

PARTS AND TOOLS REQUIRED

1. DigiWx® AWOS hand held display unit (HHDU)
2. 3 mm Allen wrench
3. Socket wrench and 13/16" socket
4. Large rubber band

VERIFICATION INSTRUCTIONS

1. At the DATU display terminal, issue a NOTAM advisory to alert users that the DigiWx system is being serviced prior to beginning this maintenance tasks. The NOTAM to be issued is **"DigiWx system being serviced, do not use current weather data outputs."** Verify that this NOTAM advisory is displayed on the operator screen prior to beginning this maintenance tasks. Refer to the "DigiWx Operator Manual" sections 4.2.2.5 and 4.2.2.6 for instructions on how to enter and delete NOTAMs.
2. Put the DigiWx® AWOS in "service mode" by toggling the "ALERT MESSAGE" toggle switch located on the lower half of the hinged tower section six (6) times (See Table 3). This will assure that pushing "REFRESH" on the HHDU will display instantaneous rather than averaged wind direction, and true rather than magnetic information..
3. Remove tower-securing bolts and tilt the tower until the cross arm is at a comfortable working height to access the wind direction sensor. Secure it in that position by tying the rope around the base of the DigiWx® tower (refer to figure 23).
4. Power on the DigiWx® AWOS HHDU. The word "ALERT" must now be displayed across the rectangular HHDU runway display. Push the "PAGE" button and the message "DigiWx® AWOS being serviced" must appear.
5. The Alert messages are programmed in the same order as they appear in Table 3. If an alert message other than message 6. is displayed, consult the list of alert messages in Table 3. Toggle the tower switch an appropriate number of times until the "DigiWx® AWOS being serviced" alert message is displayed. For example, if the alert message number 2 is displayed, toggle the switch 4 times.
6. Position the wind vane so that it is vertical and parallel to the red pointer installed on the sensor body. Secure the vane in that position by placing a rubber band around the tail of the direction vane and the transmitter antenna as shown in figure 27.

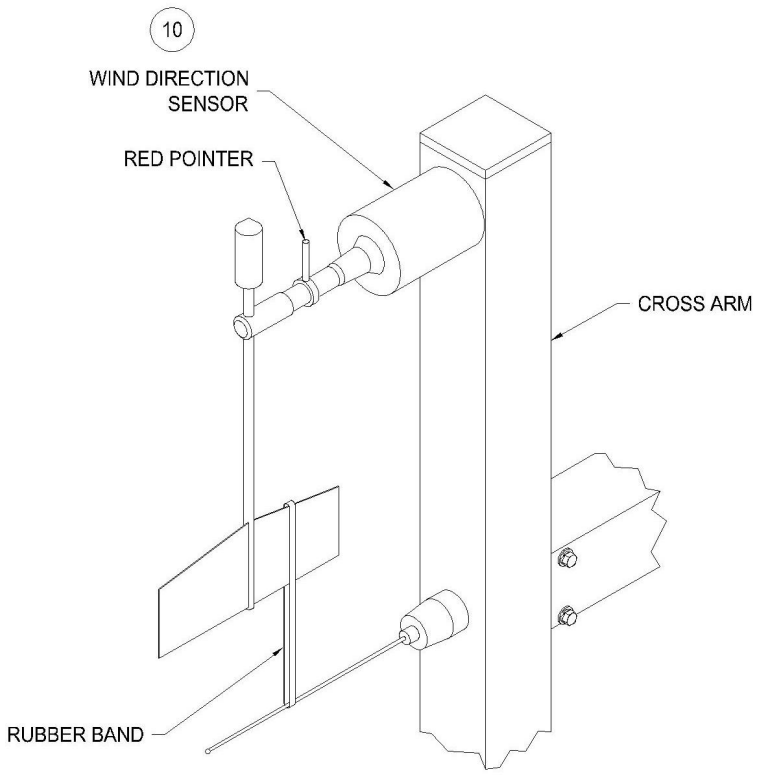

Figure 27
Wind Direction Vane Alignment

7. Press the "REFRESH" button on the DigiWx® AWOS HHDU and verify that the wind direction is 360°. If the direction does not read 360°, verify that the vane is aligned parallel with the red pointer and parallel to the long axis of the cross arm. If adjustments need to be made, proceed with Steps 7 thru 14 below.
8. Remove the three (3) red plastic plugs and loosen the three (3) socket head screws holding the direction sensor to the cross arm.
9. Rotate the sensor bottle in the direction required to obtain a reading of 360°.
10. Wait for five (5) seconds, press the "REFRESH" button on the HHDU, and read the wind direction. Repeat this process until a reading of 360° is obtained.
11. Tighten the three (3) socket head screws securely using the supplied Allen wrench.
12. Press the "REFRESH" button again to verify that the wind direction still reads 360°.
13. Remove the rubber band from the vane and antenna.
14. Reinstall the three (3) red plastic plugs into the three (3) sensor mounting access-holes in the cross arm.
15. Locate the True North Monument. Using a stepladder, sight along the folded tower section to assure it points to the True North Monument.
16. Rotate the direction vane 360° and verify it is free to turn with no rough spots in rotation. Noise or sudden rotational resistance indicates worn bearings and the unit must be replaced. This is a digital sensor, if the true north direction is reported accurately; all other directions will also be reported accurately. If a segment of the sensor is out, the error log will report recurring problems.

17. Untie the rope and SLOWLY erect the tower to the vertical position and secure it by installing and tightening (DO NOT OVER TIGHTEN) the three (3) tower-securing bolts. NOTE: Be careful to avoid pinching the wires on the inside of the hinged tower section when raising the tower.
18. Toggle the "ALERT MESSAGE" switch 4 times to return the unit to service. Push the "refresh" button on the HHDU to make sure the "ALERT MESSAGE" is gone and that the system begins reporting weather data as expected.
19. If all maintenance tasks are complete, issue another NOTAM advising users that "**DigiWx maintenance activities were completed, system has been returned to normal operation**." The expiration date and time of this NOTAM should coincide with the same expiration date and time of the previous advisory NOTAM that was issued to put the system in the maintenance mode. Verify that this NOTAM advisory is correctly displayed on the operator screen. Refer to the *"DigiWx Operator Manual"* sections 4.2.2.5 and 4.2.2.6 for instructions on how to enter and delete NOTAMs.

9.7 WIND SPEED SENSOR – VERIFICATION PROCEDURE

The wind speed sensor verification procedure is a confidence test, which verifies that the DigiWx® AWOS wind speed readings compare reasonably with measurements taken from a reference Kestrel Model 3000 Wind Instrument.

SAFETY PRECAUTIONS

1. Before starting any power installation tasks, ensure that the A/C power circuit breaker is in the open position.
2. Do not perform DigiWx® AWOS installation tasks during a thunderstorm.
3. Use extreme caution when lowering the tilt-over tower whenever ice or snow has accumulated on the tower cross arm or the sensors. The extra weight may cause the tower to fall over rapidly.

PARTS AND TOOLS REQUIRED

1. DigiWx® AWOS hand held display unit (HHDU)
2. Kestrel Model 3000 Wind Instrument

VERIFICATION INSTRUCTIONS

1. Turn on the HHDU. Stand near the base of the DigiWx® tower, facing into the wind. Observe the DigiWx® wind indicator vane to ascertain wind direction. Turn on the Kestrel Model 3000, select average mode, and hold the Kestrel Model 3000 as high as possible, square to the wind for approximately one minute. Observe the average on the Kestrel and compare it to the wind speed measured by the DigiWx® and displayed on the HHDU. Press refresh to get the most recent HHDU data. The wind speed readings should agree within 20% for speeds above 5 knots.
2. If the readings do not agree within 20%, the wind speed sensor should be replaced.

10.0 SYSTEM ALIGNMENT AND CHECKOUT – The DigiWx AWOS system has been completely aligned and tested at the factory. Final checkout consists of performing and documenting the verification procedures Sections 9.2 through 9.6. These final checkouts should be completed and documented prior to the FAA commissioning inspection to prepare for the inspection and to assure a successful commissioning of the system.

11.0 CUSTOMER SUPPORT AND ASSISTANCE – Belfort Instrument maintains a website, http://www.belfortinstrument.com containing an AWOS product support link. This website provides an efficient method of providing owners and maintenance personnel the most up-to-date product information and support available to AWOS users. For additional customer support, owners and approved maintenance personnel can call Belfort Instrument at 1-800-937-2353.

Appendix A

FAA Construction Notification Requirements & Forms

Please Type or Print on This Form Form Approved OMB No. 2120-0001

U.S. Department of Transportation
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

Notice of Proposed Construction or Alteration

FOR FAA USE ONLY
Aeronautical Study Number
- - -

1. Sponsor *(person, company, etc. proposing this action) :*
Attn. of: _____
Name: _____
Address: _____
City: _____ State: _____ Zip: _____
Telephone: _____ Fax: _____

2. Sponsor's Representative *(if other than #1) :*
Attn. of: _____
Name: _____
Address: _____
City: _____ State: _____ Zip: _____
Telephone: _____ Fax: _____

3. Notice of: ☐ New Construction ☐ Alteration ☐ Existing

4. Duration: ☐ Permanent ☐ Temporary (months, days)

5. Work Schedule: Beginning _____ End _____

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line
☐ Landfill ☐ Water Tank ☐ Other _____

7. Marking/Painting and/or Lighting Preferred:
☐ Red Lights and Paint ☐ Dual - Red and Medium Intensity White
☐ White - Medium Intensity ☐ Dual - Red and High Intensity White
☐ White - High Intensity ☐ Other _____

8. FCC Antenna Structure Registration Number *(if applicable):*
_____

9. Latitude: _____° _____' _____.____"

10. Longitude: _____° _____' _____.____"

11. Datum: ☐ NAD 83 ☐ NAD 27 ☐ Other _____

12. Nearest: City: _____ State: _____

13. Nearest Public-use (not private-use) or Military Airport or Heliport:
_____

14. Distance from #13. to Structure: _____

15. Direction from #13. to Structure: _____

16. Site Elevation *(AMSL):* _____ **ft.**

17. Total Structure Height *(AGL):* _____ **ft.**

18. Overall height (#16. + #17.) *(AMSL):* _____ **ft.**

19. Previous FAA Aeronautical Study Number (if applicable):
_____ - OE

20. Description of Location: (Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey.)

21. Complete Description of Proposal:

Frequency/Power (kW)	

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of $1,000 per day until the notice is received, pursuant to 49 U.S.C., section 46301 (a).

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking and lighting standards as necessary.

Date	Typed or Printed name and Title of Person Filing Notice	Signature

INSTRUCTIONS FOR COMPLETING FAA FORM 7460-1

PLEASE TYPE or PRINT

ITEM #1. Please include the name, address, and phone number of a personal contact point as well as the company name.

ITEM #2. Please include the name, address, and phone number of a personal contact point as well as the company name.

ITEM #3. New Construction would be a structure that has not yet been built.

Alteration is a change to an existing structure such as the addition of a side mounted antenna, a change to the marking and lighting, a change to power and/or frequency, or a change to the height. The nature of the alternation shall be included in **ITEM #21** "Complete Description of Proposal".

Existing would be a correction to the latitude and/or longitude, a correction to the height, or if filing on an existing structure which has never been studied by the FAA. The reason for the notice shall be included in **ITEM #21** "Complete Description of Proposal".

ITEM #4. If Permanent, so indicate. If Temporary, such as a crane or drilling derrick, enter the estimated length of time the temporary structure will be up.

ITEM #5. Enter the date that construction is expected to start and the date that construction should be completed.

ITEM #6. Please indicate the type of structure. **DO NOT LEAVE BLANK.**

ITEM #7. In the event that obstruction marking and lighting is required, please indicate type desired. If no preference, check "other' and indicate "no preference'. **DO NOT LEAVE BLANK.** ***NOTE:*** *High intensity lighting shall be used only for structures over 500'AGL.* In the absence of high intensity lighting for structures over 500' AGL, marking is also required.

ITEM #8. If this is an existing tower that has been registered with the FCC, enter the FCC Antenna Structure Registration number here.

ITEM #9. and **#10.** Latitude and longitude must be geographic coordinates, accurate to within the nearest second or to the nearest hundredth of a second if known. Latitude and longitude derived solely from **a hand-held GPS instrument is NOT acceptable.** A hand-held GPS is only accurate to within 100 meters *(328 feet)* 95 per cent of the time. This data, when plotted, should match the site depiction submitted under **ITEM #20.**

ITEM #11. NAD 83 is preferred; however, latitude/longitude may be submitted in NAD 27. Also, in some geographic areas where NAD 27 and NAD 83 are not available other datums may be used. It is important to know which datum is used. **DO NOT LEAVE BLANK.**

ITEM #12. Enter the name of the nearest city/state to the site. If the structure is or will be in a city, enter the name of that city/state.

ITEM#13. Enter the full name of the nearest public-use (not private-use) airport (or heliport) or military airport (or heliport) to the site.

ITEM #14. Enter the distance **from** the airport or heliport listed in **#13 to the structure.**

ITEM #15. Enter the direction **from** the airport or heliport listed in **#13 to the structure.**

ITEM #16. Enter the site elevation above mean sea level and expressed in **whole feet** rounded to the nearest foot (e.g. 17' 3" rounds to 17', 17'6" rounds to 18'). This data should match the ground contour elevations for site depiction submitted under **ITEM #20.**

ITEM #17. Enter the total structure height **above ground level** in **whole feet** rounded to the **next highest foot** (e.g. 17'3" rounds to 18'). **The total structure height shall include anything mounted on top of the structure, such as antennas, obstruction lights, lightning rods, etc.**

ITEM #18. Enter the overall height above mean sea level and expressed in **whole feet.** This will be the total of **ITEM #16 + ITEM #17.**

ITEM #19. If an FAA aeronautical study was previously conducted, enter the previous study number.

ITEM #20. Enter the relationship of the structure to roads, airports, prominent terrain, existing structures, etc. Attach an 8-1/2" X 11" non-reduced copy of the appropriate 7.5 minute U.S. Geological Survey (USGS) Quadrangle Map MARKED WITH A PRECISE INDICATION OF THE SITE LOCATION. To obtain maps, Contact USGC at 1-800-435-7627 or via Internet at "http://mapping.usgs.gov". If available, attach a copy of a documented site survey with the surveyor's certification stating the amount of vertical and horizontal accuracy in feet.

ITEM #21.

- For transmitting stations, include maximum effective radiated power (ERP) and all frequencies.
- For antennas, include the type of antenna and center of radiation *(Attach the antenna pattern, if available).*
- For microwave, include azimuth relative to true north.
- For overhead wires or transmission lines, include size and configuration of wires and their supporting structures *(Attach depiction).*
- For **each** pole/support, include coordinates, site elevation, and structure height above ground level or water.
- For buildings, include site orientation, coordinates of **each** corner, dimensions, and construction materials,
- For alterations, explain the alteration thoroughly,
- For existing structures, thoroughly explain the reason for notifying the FAA *(e.g. corrections, no record of previous study, etc.).*

Filing this information with the FAA does not relieve the sponsor of this construction or alteration from complying with any other federal state or local rules or regulations. If you are not sure what other rules or regulations apply to your proposal, contact local/state aviation and zoning authorities.

Paperwork Reduction Work Act Statement: This information is collected to evaluate the effect of proposed construction or alteration on air navigation and is not confidential. Providing this information is mandatory for anyone proposing construction or alteration that meets or exceeds the criteria contained in 14 CFR , part 77. We estimate that the burden **of** this collection is an average 19 minutes per response. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless R displays a currently valid OMB control number. The OMB control number for this collection is 2120-0001.

FAA Form 7460-1 (2-99) Supersedes Previous Edition NSN: 0052-00-012-0008

NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION

§77.13 Construction or alteration requiring notice.

(a) Except as provided in §77.15, each sponsor who proposes any of the following construction or alteration shall notify the Administrator in the form and manner prescribed in §77.17:

(1) Any construction or alteration of more than 200 feet in height above the ground level at its site.

(2) Any construction or alteration of greater height than an imaginary surface extending outward and upward at one of the following slopes:

(i) 100 to l for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport specified in paragraph (a) (5) of this section with at least one runway more than 3,200 feet in actual length, excluding heliports.

(ii) 50 to 1 for a horizontal distance of l0,000 feet from the nearest point of the nearest runway of each airport specified in paragraph (a) (5) of this section with its longest runway no more than 3,200 feet in actual length, excluding heliports.

(iii) 25 to l for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport specified in paragraph (a) (5) of this section.

(3) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) (1) or (2) of this section.

(4) When requested by the FAA, any construction or alteration that would be in an instrument approach area (defined in the FAA standards governing instrument approach procedures) and available information indicates it might exceed a standard of Subpart C of this part.

(5) Any construction or alteration on any of the following airports (including heliports):

(I) An airport that is available for public use and is listed in the Airport Directory of the current Airman's Information Manual or in either the Alaska or Pacific Airman's Guide and Chart Supplement.

(ii) An airport under construction, that is the subject of a notice or proposal on file with the Federal Aviation Administration, and except for military airports, is clearly indicated that that airport will be available for public use.

(III) An airport that is operated by an armed force of the United States.

(b) Each sponsor who proposes construction or alteration that is the subject of a notice under paragraph (a) of this section and is advised by an FAA regional office that a supplemental notice is required shall submit that notice on a prescribed form to be received by the FAA regional office at least 48 hours before the start of construction or alteration.

(c) Each sponsor who undertakes construction or alteration that is the subject of a notice under paragraph (a) of this section shall, within 5 days after that construction or alteration reaches its greatest height, submit a supplemental notice on a prescribed form to the FAA regional office having jurisdiction over the region involved, if -

(1) The construction or alteration is more than 200 feet above the surface level of its site; or

(2) An FAA regional office advises him that submission of the form is required.

§77.15 Construction or alteration not requiring notice.

No person is required to notify the Administrator for any of the following construction or alteration:

(a) Any object that would be shielded by existing structures of a permanent and substantial character or by natural terrain or topographic features of equal or greater height, and would be located in the congested area of a city, town, or settlement where it is evident beyond all reasonable doubt that the structure so shielded will not adversely affect safety in air navigation.

(b) Any antenna structure of 20 feet or less in height except one that would increase the height of another antenna structure.

(c) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device, of a type approved by the Administrator, or an appropriate military service on military airports, the location and height of which is fixed by Its functional purpose.

(d) Any construction or alteration for which notice is required by any other FAA regulation.

§77.17 Form and time of notice.

(a) Each person who is required to notify the Administrator under §77.13 (a) shall send one executed form set of FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the Manager, Air Traffic Division, FAA Regional Office having jurisdiction over the area within which the construction or alteration will be located. Copies of FAA Form 7460-1 may be obtained from the headquarters of the Federal Aviation Administration and the regional offices.

(b) The notice required under §77.13 (a) (1) through (4) must be submitted at least 30 days before the earlier of the following dates -

(1) The date the proposed construction or alteration is to begin.

(2) The date an application for a construction permit is to be filed.

However, a notice relating to proposed construction or alteration that is subject to the licensing requirements of the Federal Communications Act may be sent to the FAA at the same time the application for construction is filed with the Federal Communications Commission, or at any time before that filing.

(e) A proposed structure or an alteration to an existing structure that exceeds 2,000 feet in height above the ground will be presumed to be a hazard to air navigation and to result in an inefficient utilization of airspace and the applicant has the burden of overcoming that presumption. Each notice submitted under the pertinent provisions of this part 77 proposing a structure in excess of 2,000 feet above ground, or an alteration that will make an existing structure exceed that height, must contain a detailed showing, directed to meeting this burden. Only in exceptional cases, where the FAA concludes that a clear and compelling showing has been made that it would not result in an inefficient utilization of the airspace and would not result in a hazard to air navigation, will a determination of no hazard be issued.

(d) In the case of an emergency involving essential public services, public health, or public safety that requires immediate construction or alteration, the 30 day requirement in paragraph (b) of this section does not apply and the notice may be sent by telephone, telegraph, or other expeditious means, with an executed FAA Form 7460-1 submitted within five (5) days thereafter. Outside normal business hours, emergency notices by telephone or telegraph may be submitted to the nearest FAA Flight Service Station.

(e) Each person who is required to notify the Administrator by paragraph (b) or (c) of §77.13, or both, shall send an executed copy of FAA Form 7460-2, Notice of Actual Construction or Alteration, to the Manager, Air Traffic Division, FAA Regional Office having jurisdiction over the area involved.

ADDRESSES OF THE REGIONAL OFFICES

Alaska Region
AK
Alaskan Regional Office
Air Traffic Division, AAL-530
222 West 7th Avenue
Anchorage, AK 99513
Tel: 907-271-5893

Central Region
IA, KS, MO, NE
Central Regional Office
Air Traffic Division, ACE-520
601 East 12th Street
Kansas City, MO 64106
Tel: 816-426-3408 or 3409

Eastern Region
DC, DE, MD, NJ, NY, PA, VA, WV
Eastern Regional Office
Air Traffic Division, AEA-520
JFK International Airport
Fitzgerald Federal Building
Jamaica, NY 11430
Tel: 718-553-2616

Great Lakes Region
IL, IN, MI, MN, ND, OH, SD, WI
Great Lakes Regional Office
Air Traffic Division, AGL-520
2300 East Devon Avenue
Des Plaines, IL 60018
Tel: 847-294-7568

New England Region
CT, MA, ME, NH, RI, VT
New England Regional Office
Air Traffic Division, ANE-520
12 New England Executive Park
Burlington, MA 01803-5299
Tel: 781-238-7520

Northwest Mountain Region
CO, ID, MT, OR, UT, WA, WY
Northwest Mountain Regional Office
Air Traffic Division, ANM-520
1601 Lind Avenue, SW
Renton, WA 98055-4056
Tel: 425-227-2520

Southern Region
AL, FL, GA, KY, MS, NC, PR, SC, TN, VI
Southern Regional Office
Air Traffic Division, ASO-520
1701 Columbia Avenue
College Park, GA 30337
Tel: 404-305-5585

Southwest Region
AR, LA, NM, OK, TX
Southwest Regional Office
Air Traffic Division, ASW-520
2601 Meacham Boulevard
Fort Worth, TX 76137-0520

Western Pacific Region
HI, CA, NY, AZ, GU
Western-Pacific Regional Office
Air Traffic Division, AWP-520
15000 Aviation Boulevard
Hawthorne, CA 90260
Tel: 310-725-6557

Form Approved OMB No. 2120-0001

SUPPLEMENTAL NOTICE

Submission Instructions: For Advance Notice of Actual Construction or Alteration. Complete items 1, 2, 3A(1), 3A(2), and 6. If applicable, also complete items 4 and 5. Detach Part 1. Fold and tape at bottom. Mail to the FAA Regional Office for your area. Part 1A is provided for your file.

Aeronautical Study No.

U.S. Department of Transportation
Federal Aviation Administration

Notice of Actual Construction or Alteration

(Please Type or Print on this Form)

1. Construction

A. Type and Description of Construction
☐ New
☐ Alteration

B. Owner of Structure

2. Construction Location --- Height

A. Coordinates *(To hundredths of seconds, if known)*
Latitude 0 ' " .
Longitude 0 ' " .

B. Location *(City, State, include street Address if any)*

C. Construction Heights
Site Elevation Ft. AMSL
Structure Height Ft. AGL
Total Height *(Structure & Site)* Above Mean Sea Level Ft. AMSL

D. Site Elevation Determined By
☐ Actual Survey
☐ USGS 7.5' Quad Chart
☐ Other *(Specify)*

E. Reference datum of coordinates
☐ NAD 27
☐ NAD 83
☐ Other *(Specify)*

F. Name of Nearest Public-Use or Military Airport *(Include Distance and Direction from the Airport)*

3. Construction Notifications

A. Notification (Notice is Critical to Flight Safety --- FAR Part 77 Required)	Date	B. Construction/Project	Date
★ (1) Construction will start *(Submit at least 48 hrs. in advance)*		(1) Project Abandoned	
(2) Estimated Completion			
★ (3) Structure Reached Greatest Height *(Submit within 5 days)*		(2) Construction Dismantled	

4. Marking and Lighting

A. Marked
☐ Yes ☐ No ☐ Temporary

B. Lighted
☐ Medium Intensity White ☐ High Intensity White ☐ Red
☐ Dual (Medium Intensity White & Red) ☐ Dual (High Intensity White & Red ☐ None

5. Antenna Requiring FCC License

A. Call Sign	B. Frequency	C. Date Applied for FCC Construction Permit	D. Date Construction Permit Issued

6. Preparer's Certification

Submitted By. (If submitted by a proponent's representative, please also complete item B.)

A. Proponent's Representative
Name:
Address:
Tel. No.: *(Include Area Code)*

A. Construction Proponent
Name:
Address:
Tel. No.: *(Include Area Code)*

I hereby certify that the information provided is true, complete, and correct to the best of my knowledge.

Signature	Title	Date

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of $1,000 per day until the notice is received, pursuant to 49 U.S.C., Section 46301 (a).

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